IN THE CIRCUIT COURT OF THE STATE OF OREGON

FOR THE COUNTY OF MULTNOMAH

COUNTY OF MULTNOMAH, Plaintiff, v. EXXON MOBIL CORP., ET AL Defendants.	Case No. 23CV25164 **AFFIDAVIT**

BEFORE ME, the undersigned authority, on this day personally appeared JOHN WASIUTYNSKI who, being by me duly sworn, deposed on his/her oath as follows:

"My name is John Wasiutynski and I am the Director of the Office of Sustainability for Multnomah County, Oregon. I am authorized to speak on behalf of the County regarding the topics contained herein in the matter of *County of Multnomah v. Exxon Mobil Corp., et al, No. 23CV25164*. I am of sound mind, have never been convicted of a felony and all of the facts stated in this affidavit are based on my personal knowledge.

Throughout the period of June 25, 2021 – July 2, 2021, Multnomah County experienced an extreme weather event known colloquially as a "heat dome," that struck with an intensity and relentlessness unlike any weather before it in the region's recorded history. During this time the County recorded record-breaking high temperatures during three consecutive days of 108°, 112°, and 116° Fahrenheit. Temperatures as high as 124° Fahrenheit were recorded in Portland. The intense heat caused enormous harm to the County and its residents. The cables in cable cars

literally melted. There were 69 heat-related deaths among County residents during this week.[1] Most of them died while inside their homes. More County residents lost their life from the June 2021 extreme heat event in Multnomah County than died from heat in the entire State of Oregon in the past 20 years. (*id*). In addition, deaths from all causes were double the normal level during the week of the heat dome, and there were 257 emergency department visits for heat illness in Multnomah County in 2021. In a typical year there are 83. (*id*). The impact of this extreme heat event was most devastating to those in the community who were the most vulnerable and least able to cope.[2]

Multnomah County typically enjoys a temperate climate, with an average June high temperature around 78° Fahrenheit, but over recent years the region's summers have become hotter, longer, and drier due to anthropogenic (human caused) climate change. The County tracks and uses this type of information to inform planning and policy efforts. 'But the shocking temperature swing that began June 25th arrived years earlier than expected.' (*id*). The County is governed by duly elected Board comprised of County Commissioners, whose mandate is to govern over matters of county concern. The County was unaware that extreme temperatures, such as those that occurred in June of 2021, were possible in Multnomah County. The County was unaware, and could not have foreseen, that a heat event as extreme as this one would occur this soon in time. 'Multnomah County had developed an extreme heat response plan with a range of interventions meant to help the community prepare for events of differing severity. But no one predicted a heat event of this magnitude at this time.'[3] In short, Multnomah County lacked

[1] **Final report: health Impacts from Excessive Heat Events in Multnomah County Oregon 2021** (a true and accurate copy of which is attached hereto as Exhibit C)

[2] **June 2021 Extreme Heat Event Preliminary Findings and Action Steps** (a true and accurate copy of which is attached hereto as Exhibit A)

[3] **Preliminary Review on Excessive Heat Deaths Multnomah County June 2021** (a true and accurate copy of which is attached hereto as Exhibit B)

accurate and timely information relating to the imminent risks from the severity of this weather in this region. As a result, the County was unprepared and under prepared for a disaster of this magnitude and had not implemented enough heat-adaptive measures to protect the County and its residents. Had any fossil fuel producer or their representatives been truthful to the County that it should expect extreme heat events of the type and severity that struck the County in June and July of 2021, the County would have better prepared for the heat's destructive potential, and likely new normal. Had they done so, the County would have diverted more taxpayer resources to protect County residents from extreme heat, measures that would have included, not exhaustively, ensuring that each resident had sufficient access to air-temperature-controlled shelter, cooling stations, water, and prompt emergency care for heat-related illnesses. The County received no such warnings, and in fact, it had to contend with misinformation fossil fuel producers have long used to deny or downplay the magnitude and timing of harmful climate change – misinformation that needlessly but effectively sewed substantial public doubt about the likelihood, severity, and imminence of human-made climate destruction in our community, like that rendered by the extreme heat of 2021.

In September 2020, a series of unprecedented wildfires started in the Cascade and Coastal mountain ranges sending unprecedented amounts of smoke into Multnomah County. Between September 10, 2020, for five consecutive days Multnomah County experienced a spike in health-related visits related to the smoke that covered the County from those fires. Smoke from regional fires caused local air quality to reach unprecedented levels of health hazard across the County. The County was unaware that wildfire and wildfire smoke, such as those that occurred in 2020, were possible in Multnomah County. The County was unaware, and could not have foreseen, that smoke from wildfires elsewhere caused the unhealthiest air ever recorded in Multnomah County. Acute health impacts during this event were observed by a 75% spike of asthma-like

symptoms seen in emergency rooms and urgent care clinics. Chronic health impacts from this event may take time to fully understand, but exposure to wildfire smoke has tremendously negative health effects and can lead to significant additional deaths over time further burdening the County. No other recent wildfire smoke events have approached the 2020 event in severity. Again, Multnomah County lacked accurate and timely information relating to the imminent risks from the severity of this impact in the region. As a result, the County was unprepared and under prepared for a disaster of this magnitude and had not implemented enough smoke resilience measures to protect the County and its residents. Had any fossil fuel producer or their representatives been truthful to the County that it should expect increased wildfires and to be drowned in smoke containing particulate matter of the type and severity that struck the County in 2020, the County would have better prepared for the devastating and lasting effects.

Multnomah County must now incur extensive costs to deal with the aftermath of these events and prepare for the likelihood of future similar events. These steps include, but are not limited to: improved planning to increase the number of cooling interventions, including shelters, centers and spaces, throughout the County; increased access to air conditioning; better air filtration systems; better emergency response preparedness; increased communications; outreach and education; improved planning; and other steps, many of which are expressed in more detail in the June 2021 Extreme Heat Event Preliminary Findings and Action Steps. (*See* Exhibit A). It is estimated that the past costs to the County from this event are in the range of $50 million dollars and the future costs to the County will be in the range of billions of dollars.

In an effort to mitigate and seek redress and accountability for these harms, on June 22, 2023, the Multnomah County Attorney's Office was authorized by the County to bring this lawsuit pursuant to § 25.320 of the Multnomah County Code (*See* Board resolution No 2023-065 (Exhibit D)). The Multnomah County Attorney's office filed the instant suit, in its official

capacity, and with the assistance of outside counsel, to seek redress for the harms described herein."

Further affiant sayeth not.

John Wasiutynski

Sworn to and subscribed before me this 19th day of May, 2025.

Notary Public in and for the
State of Oregon

Amy Goodale
Printed name of Notary Public

My commission expires: June 17, 2028

OFFICIAL STAMP
AMY GOODALE
NOTARY PUBLIC - OREGON
COMMISSION NO. 1048916
MY COMMISSION EXPIRES JUNE 17, 2028

EXHIBIT A

June 2021 Extreme Heat Event

Preliminary Findings and Action Steps

Multnomah County

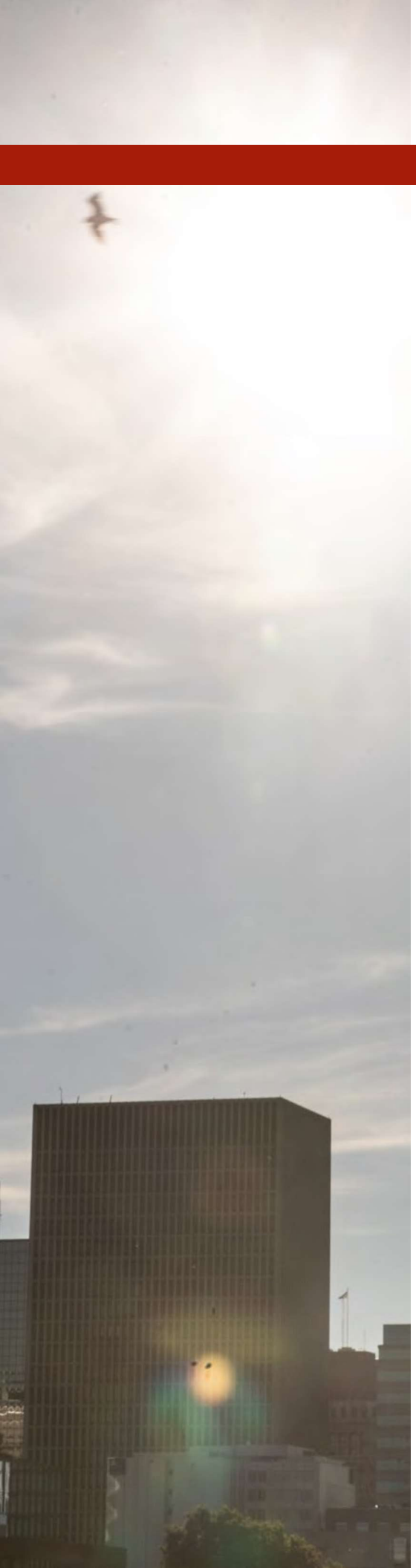


Table of Contents

Executive Summary

A weather emergency in a pandemic

The “heat dome” that arrived in Multnomah County on June 25, 2021, settled over a community still in a state of emergency from the COVID-19 pandemic. Fifteen months of shuttered schools, institutions and businesses had strained the safety net, increasing social isolation and the risk of experiencing homelessness. Though many people have become more vulnerable than ever because of the disruptions of the pandemic, not everyone has been impacted equally — a result of inequities created by systemic/structural racism, intergenerational poverty, income inequality and federal disinvestment in social services.

Multnomah County has long tracked and recognized that the region’s summers are growing hotter and drier due to climate change, and recognized the impact that these stressors would have on vulnerable communities. We use that information to inform our planning and policy efforts. But the shocking temperature swing that began June 25 arrived years earlier than expected, a crisis within multiple crises. And like many of the preceding emergencies, the impact was most immediately felt by those least able to flee or to cope.

Record temperatures

Between June 25 and June 30, 2021, the County recorded temperatures during three consecutive days of 108, 112 and 116 degrees, shattering previous records. Temperatures remained high overnight during this period, providing little relief. Warm overnight temperatures over consecutive days — when homes and apartments without air conditioning do not cool down at night — are a primary driver of heat-related illness, hospital visits and deaths during extreme heat events.[1]

Multnomah County swiftly developed a three-pronged strategy for the approaching heat: provide space where people could cool off; undertake extensive in-person outreach to seniors, people with disabilities and people experiencing homelessness; and communicate the risk that extreme heat posed to everyone in the community.

Coordinating with nearly 100 agency and organizational partners, the County:

- Launched three Cooling Shelters, serving a total of 1,400 overnight guests and providing 6,330 meals.
- Opened nine libraries as Cooling Spaces.
- Coordinated the work of nearly 100 outreach teams, mutual aid groups and community volunteers, who collectively distributed 14,000 cooling towels, 32,000 electrolyte packets, 8,000 containers of sunscreen, 4,500 hygiene kits, 67,000 water bottles and several hundred box fans to community members.
- Created and posted 27 graphics on warnings, heat stroke, and at-risk populations like kids, seniors and outdoor workers.
- Translated 12 graphics into languages other than English.
- Conducted outreach to at-risk County clients, including pregnant clients and clients with infants (reaching 12,000 people via text in multiple languages), as well as high-risk older adults and people with disabilities, reaching 3,850 people living in their own homes and 630 people living in adult care homes.

1 Preliminary Review on Excessive Heat Deaths in Multnomah County June 2021: https://www.multco.us/preliminary-review-excessive-heat-deaths-multnomah-county-june-2021

The extreme heat led to both an unprecedented response by the County and an unprecedented loss of life. Despite the largest sheltering and outreach operation for a heat event in our history, the Multnomah County Medical Examiner's initial data, as of Aug. 3, 2021, indicated that 62 people succumbed to hyperthermia. The majority of those who died were older, white and living alone in apartment buildings.[2]

A new threat

Although extreme heat is one of the leading causes of weather-related deaths in the United States — in some years killing more people than all other weather hazards (except hurricanes) *combined*[3] — the severity of these conditions and their impacts is new for Multnomah County.

Extreme heat has not been a seasonal hazard that the County has traditionally had to plan for, because extreme heat had not been a threat. Prior to June 2021, Multnomah County recorded only two hyperthermia deaths since 2010 — one each in 2016 and 2018. More people died from the June 2021 heat wave in Multnomah County than died from heat in the entire state of Oregon in the past 20 years.

The June 2021 heat event is notable for many reasons that may have led to this event resulting in so many fatalities. Those factors include:

- The event was extreme and unprecedented in the Pacific Northwest. A preliminary climate attribution study made a direct link between the heat event and climate change, and noted that the heat event was a once-in-a-1,000-year event.
- People lacked the necessary experience with extreme heat to protect themselves. Because people may not have experienced such temperatures before, people may not have understood the severity of the threat and therefore may not have made behavior changes to adapt to the temperatures (e.g., close blinds, use air conditioning, seek out spaces with air conditioning).
- Because the event occurred early in the summer, people had not yet acclimated to hotter temperatures. Although heat is deadly, the human body can acclimate to hotter temperatures, up to a point, over time. Heat events that occur earlier in the summer tend to be more deadly.
- The pandemic limited the effectiveness of cooling interventions, since some people were reluctant to be indoors with others.

Steps the County has taken

Since the June heat wave, the County has taken a variety of steps to enhance our response to future extreme heat events, implementing changes during two subsequent heat waves in July and August. These actions include:

1. Updating our protocols to allow for earlier coordination and planning in the case of catastrophic heat, including activating Cooling Shelters at the first hint of extreme heat.
2. Activating the public alert system to make calls to the community in English and Spanish.
3. Working with 211info to create an emergency response standard that includes specific deliverables around operations response and communication needs.

---

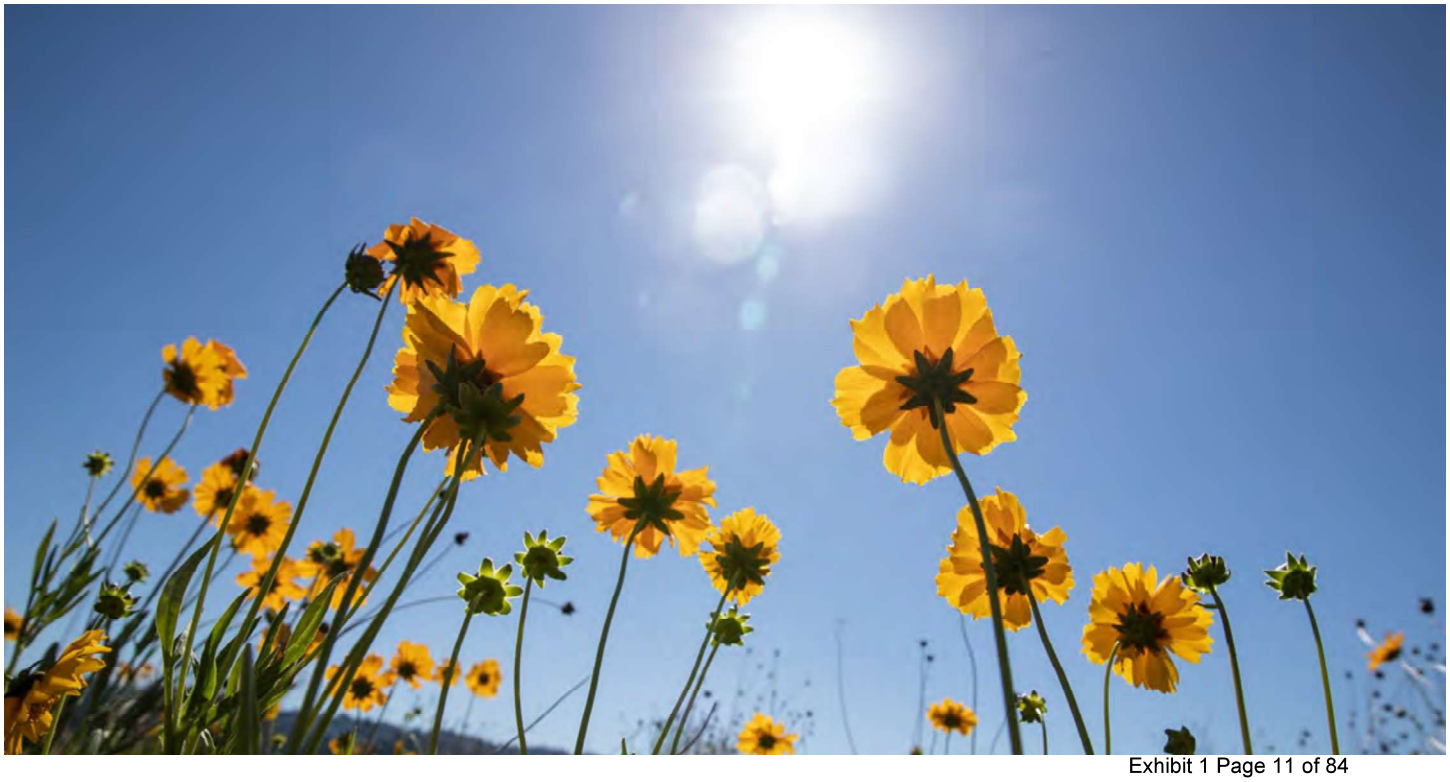
2 Preliminary Review on Excessive Heat Deaths in Multnomah County June 2021: https://www.multco.us/preliminary-review-excessive-heat-deaths-multnomah-county-june-2021

3 National Oceanic and Atmospheric Administration, Billion-Dollar Weather and Climate Disasters: Summary Stats: https://www.ncdc.noaa.gov/billions/summary-stats & Center for Climate and Energy Solutions, Heat Waves and Climate Change: https://www.c2es.org/content/heat-waves-and-climate-change/

4. Launching an effort to increase the number and geographic diversity of cooling interventions by engaging a range of community partners — including nonprofit, culturally specific and government organizations — and hosting webinars, providing technical assistance and coaching, and sharing data and best practices.
5. Initiating a countywide communication structure to formalize our coordination with partner organizations and more effectively reach the public with messaging about heat risks and resources available to stay cool.
6. Providing training and coaching for cooling shelter management to encourage new leaders to step into critical roles and to support existing leaders in developing their skills.

Our hearts go out to everyone in our community who lost a loved one to the extreme heat in June. We are committed to doing all we can to keep people safe in future heat crises. The County will continue to improve our emergency response during extreme heat and take action to mitigate and prepare for the impacts of the climate crisis.

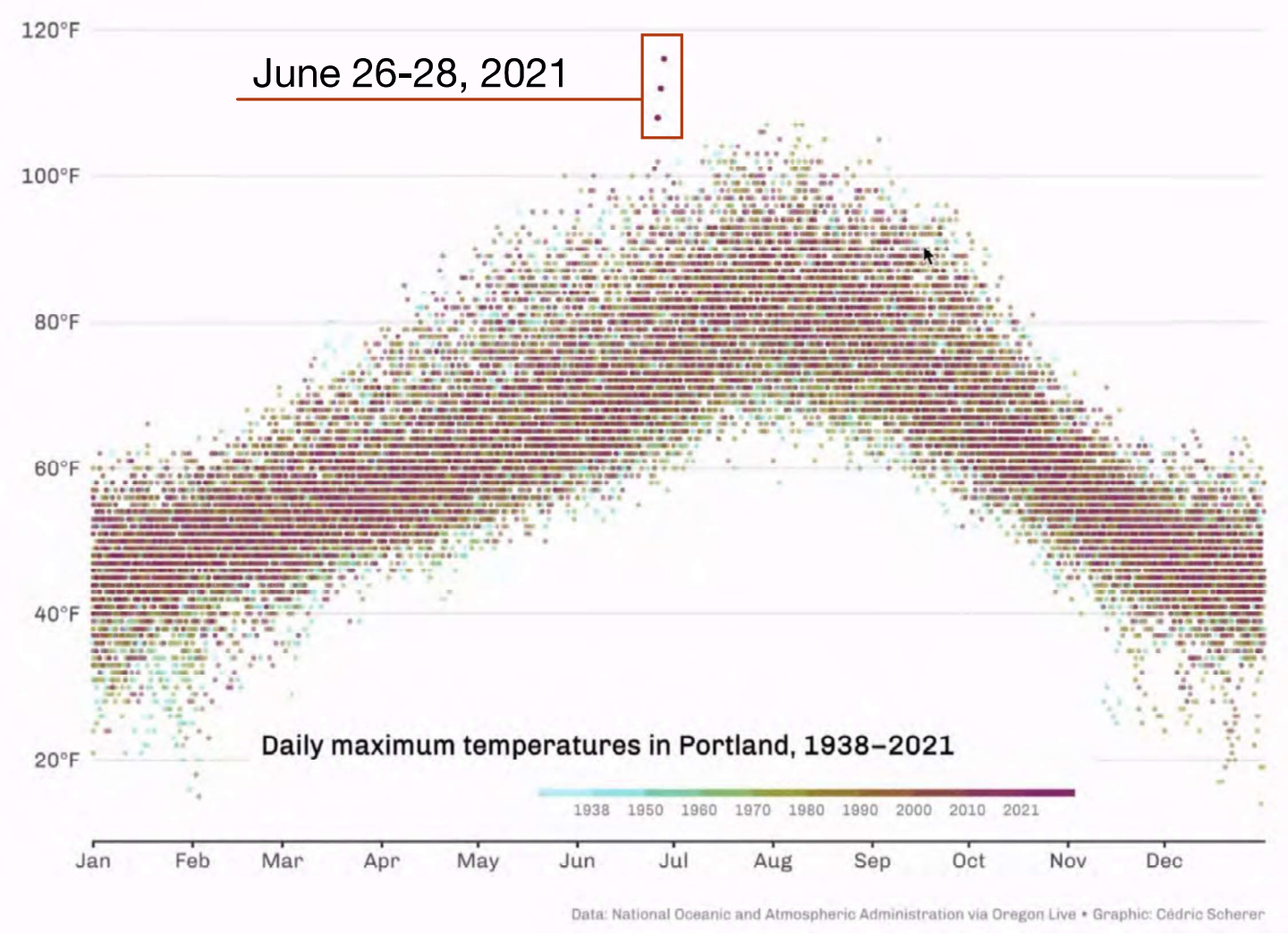
To learn more about what you can do to stay cool and support others to do the same, visit our “Help for When it’s Hot” webpage.



A Crisis within Multiple Crises

Prior to June 2021, the highest temperature ever recorded in usually temperate Multnomah County was 107 degrees Fahrenheit, which happened in 1965 and again in 1981. Between June 25 and June 30, 2021, the County recorded temperatures during three consecutive days of 108, 112, and 116 degrees, shattering the previous record high. Temperatures remained high overnight during this period, providing little relief. Warm overnight temperatures over consecutive days — when homes and apartments without air conditioning do not cool down at night — are a primary driver of heat-related illness, hospital visits and deaths during extreme heat events.[4]

The extreme heat led to both an unprecedented response by the County and an unprecedented loss of life. Despite the largest sheltering operation for a heat event in our history, the Multnomah County Medical Examiner's initial data, as of Aug. 3, 2021, indicated that 62 people succumbed to hyperthermia The majority of those who died were older, white and living alone in apartment buildings.[5]



4 Preliminary Review on Excessive Heat Deaths in Multnomah County June 2021: https://www.multco.us/preliminary-review-excessive-heat-deaths-multnomah-county-june-2021

5 Preliminary Review on Excessive Heat Deaths in Multnomah County June 2021: https://www.multco.us/preliminary-review-excessive-heat-deaths-multnomah-county-june-2021 As of August 2021, 80 people are suspected of having died of hyperthermia during the heatwave; 62 of those cases have been confirmed.

This retrospective is intended to provide a basic timeline of events and interventions initiated by Multnomah County, as well as to identify early lessons learned to better prepare for future heat waves. After every large emergency response, Multnomah County conducts an evaluation process engaging all involved County staff and partners to produce an After-Action Report with corresponding action items as part of an improvement plan. While an in-depth After-Action Report on the heat event is in development and will be available by the end of the year, the initial findings presented here come from survey results and a root cause analysis of several key themes identified by those who participated in the County's response to the June 2021 heat event. The accelerated timeline of this report is meant to help inform any extreme heat response that might be necessary before the full After-Action Report is completed.

The loss of life in those five days was, and remains, devastating. This report is dedicated to those who died and the family and friends who mourn them.

Definitions

Heat Dome

vast areas of sweltering heat that gets trapped under a high-pressure "dome."

Hyperthermia

the condition of having a body temperature greatly above normal that can be caused by exposure to heat.

Cooling Center

a type of Disaster Resource Center with air conditioning, cooling resources, water, food, and support services. These locations operate during the hottest part of the day only.

Cooling Shelter

a type of Disaster Resource Center with air conditioning, cooling resources, water, food, and support services. These locations are similar to Cooling Centers, but operate for 24-hours.

Cooling Space

an air-conditioned space open to the public with water often available. These spaces are open during the hottest part of the day only and do not operate for 24 hours. Community partners, such as houses of worship, may operate Cooling Spaces.

Cooling Resources

items like water, cooling towels, electrolytes, misters and fans, and supports such as transportation to Cooling Shelters and Centers to help someone get cool or stay cool.

A Heat Emergency Unfolds

Until recently, Cooling Centers in Multnomah County were essentially extended hours at senior centers, and were not advertised as being for the general public. Beginning in 2018, prompted in part by the County-adopted 2015 Climate Action Plan, we proactively developed standard operating procedures for identifying weather forecasts of concern and convening partners to inform a response. On May 28, 2021 — the first day temperatures hit 90 degrees this year — the County updated its "Help for When it's Hot" webpage and revisited its heat protocols. Those plans provided the blueprint for what unfolded leading up to and during the extreme heat event.

Early reports for the possibility of extreme heat began the weekend of June 19. On Monday, June 21, the National Weather Service released its first weather briefing and forecast, indicating:

- 90% chance of 90+ degree temperatures from Friday through Sunday
- 50 to 60% chance of temperatures reaching 100 or more on Saturday
- 20 to 30% chance of temperatures reaching 105 or more on Saturday

On June 23, the County held its first heat coordination call at 9 a.m., inviting 144 participants from County departments and partner organizations, including regional cities and unincorporated areas, fire districts, utilities, TriMet, Metro, and the National Weather Service. The County routinely convenes such calls during snow, ice, wildfire and smoke incidents to coordinate with other responding agencies and inform its own actions. During heat events, coordination calls are convened by the Multnomah County Office of Emergency Management as part of our extreme heat standard operating procedures.

The County coordinated with nearly 100 organizational partners during June's heat event, including the City of Portland, the American Red Cross, 211info, and Portland Fire and Rescue (See Appendix A for the full list of organizations engaged in coordination efforts and Appendix B for organizations that assisted with distribution of cooling resources).

During the initial coordination call, as the National Weather Service forecast became more certain, the County developed a three-pronged strategy for the approaching heat: provide space where people could cool off; undertake extensive in-person outreach to seniors, people with disabilities and people experiencing homelessness; and communicate the risk that extreme heat posed to everyone in the community.

The County opened three Cooling Shelters based on our Disaster Resource Center (DRC) framework[6] and in accordance with the County's COVID-19 Guidance for Shelter Settings.[7] Locations were selected to create access in different parts of Multnomah County and included the Oregon Convention Center near downtown Portland, the Arbor Lodge Shelter in North Portland, and the Sunrise Center in the Rockwood neighborhood in east Multnomah County. The Cooling Shelter at the Sunrise Center was led and staffed by Cultivate Initiatives.

With evening temperatures remaining too warm for people to cool down, for the first time in County history, these Cooling Shelters were scheduled to stay open 24 hours throughout the heat event. The County also committed to a low-barrier, no-turn-away policy, meaning we would continue to expand, or open additional locations, to ensure everyone who arrived could access life-saving assistance.

The Communications Office updated the "Help for When it's Hot" webpage, issued a media release on the potential for life-threatening heat, and began posting stories and social media and conducting media interviews. We also updated the County's Stay Cool! Interactive Map of Cooling Shelters and Cooling Spaces.

On June 24, the National Weather Service released a Heat Risk and Temperature Outlook with forecasts significantly warmer than the June 21 weather briefing. The report highlighted "unprecedented heat Saturday through Monday," predicting a high of 109 degrees on Sunday.

The County convened daily coordination calls throughout the event. These calls focused on preparedness and mitigation strategies, including calling for the cancellation of large-venue outdoor activities and canceling outdoor work performed by County staff. These calls also addressed staffing needs at Cooling Shelters and coordinated support for outreach activities. As the event entered the weekend, coordination calls began supporting operations as each new forecast showed an increase in the expected temperatures.

The County also established libraries as Cooling Spaces, extending hours at five locations initially and then opening four additional locations that had been closed due to the pandemic. Each library Cooling Space provided free bottled water, as well refuge from the daytime heat.

In addition to opening Cooling Shelters and Cooling Spaces, Multnomah County Environmental Health worked with partners to call property managers of apartments and single-room-occupancy buildings with vulnerable residents (many without air conditioning) who had been identified by an area nonprofit agency that focuses on social isolation. We advised property managers to open community rooms and lobbies for cooling, share information about Cooling Shelters And Spaces, and post our flyers about signs and symptoms of heat illness. In some cases, our partners took this information door to door and performed wellness checks.

Even before the first countywide heat call, the Joint Office of Homeless Services had begun coordinating street outreach to individuals experiencing homelessness through a network of 27 mutual aid groups and individuals, and 69 contracted and community-based nonprofit organizations. Together, relying on the Joint Office's detailed maps and known locations and camps, they distributed water and cooling kits to people living outside throughout the heat event. The Joint Office also worked with its network of approximately 40 community-based organizations to encourage and support outreach with clients in housing to help ensure their safety during the heat event.

Additionally, the Department of County Human Services had also begun focused outreach to high-risk older adults and people with disabilities — reaching 3,850 people living in their own homes and

6 Multnomah County Disaster Resource Centers: https://www.multco.us/dchs/disaster-resource-centers

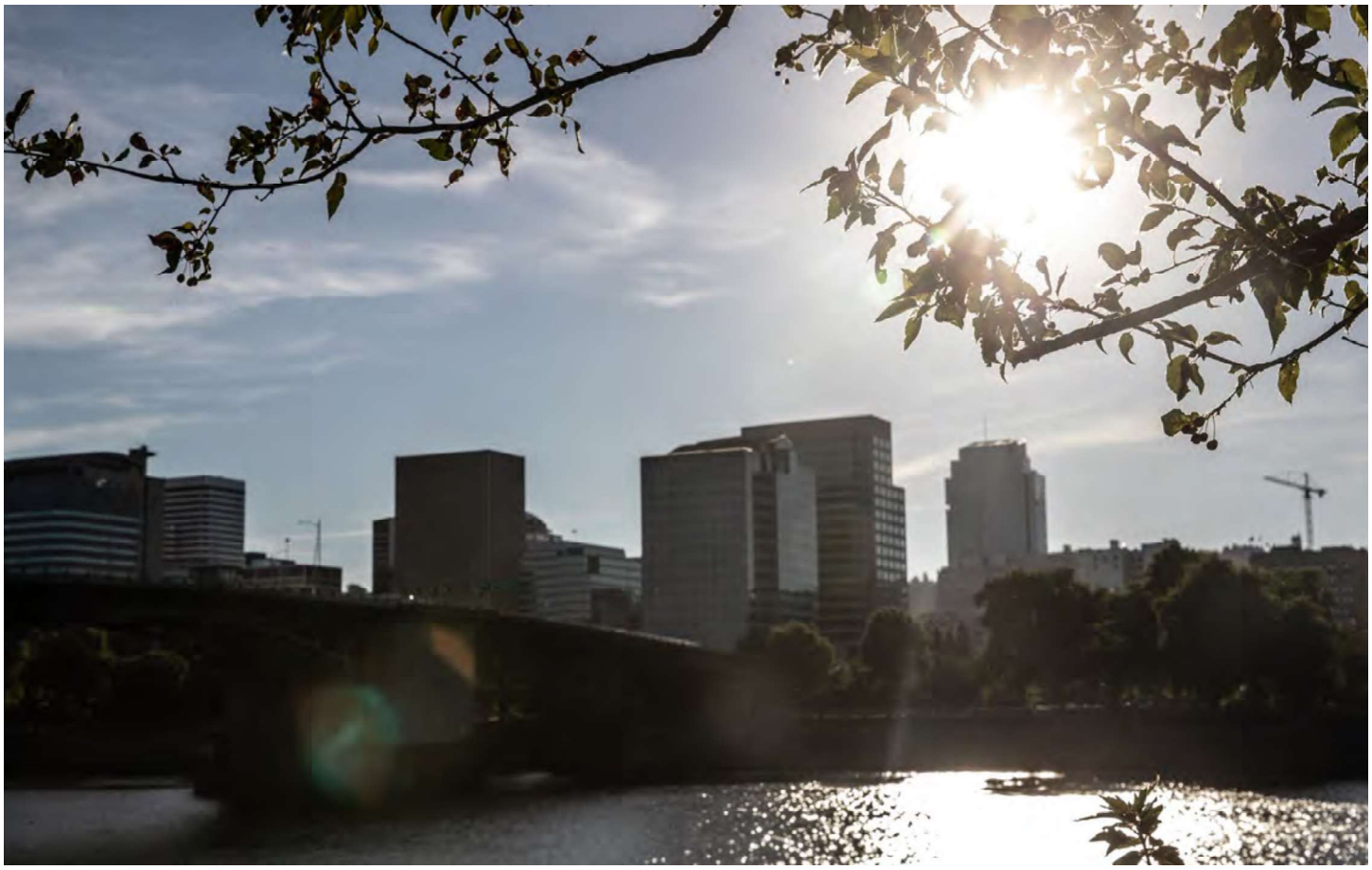
7 Multnomah County COVID-19 Guidance for Shelter Settings: https://www.multco.us/dchs/disaster-resource-centers

630 people living in adult care homes. Outreach was conducted over the phone, with referral to in-person safety checks if needed. DCHS also provided fans and information to older adults, people with disabilities and their caregivers.

Volunteers with the Portland Bureau of Emergency Management's Neighborhood Emergency Team program made phone calls to at-risk community members to ensure they knew about available resources, answer any questions and connect them with services if they expressed any needs.

Despite these extensive efforts, our most recent data shows that 62 people died from excessive heat. Although extreme heat is one of the leading causes of weather-related deaths in the United States — in some years killing more people than all other weather hazards (except hurricanes) *combined*[8] — the severity of these conditions and their impacts is new for Multnomah County. Prior to June 2021, Multnomah County had recorded only two hyperthermia deaths since 2010 — one each in 2016 and 2018. In fact, more people died from the June 2021 heat wave in Multnomah County than died from heat in the entire state of Oregon in the past 20 years.

At the time of this report, Multnomah County is still working to examine the details surrounding the deaths of those who succumbed to hyperthermia during the June 2021 heat event. Our efforts to improve will be informed by these details and what we learn from additional surveys, interviews and analysis of the response. The Centers for Disease Control and Prevention is also investigating heat-related deaths across the region. In the meantime, there are lessons we are implementing in the short term, as well as best practices we are committing to for the longer term.



8 National Oceanic and Atmospheric Administration, Billion-Dollar Weather and Climate Disasters: Summary Stats: https://www.ncdc.noaa.gov/billions/summary-stats & Center for Climate and Energy Solutions, Heat Waves and Climate Change: https://www.c2es.org/content/heat-waves-and-climate-change/

Timeline of Events

Friday, May 28

- Mult Co Emergency Management hosts a countywide coordination call in advance of the hot weather season.

Monday, June 21

- The Joint Office of Homeless Services works with partners to begin heat wave outreach.

Tuesday, June 22

- The Dept of County Human Services works with partners, caregivers, and staff to begin outreach to care facilities and clients living in their own homes/apartments.

Wednesday, June 23

Max temperature on Wednesday, June 23 is 83 degrees.

- The National Weather Service issues an Excessive Heat Watch for Multnomah County beginning Friday through at least Monday.
- Mult Co issues a press release and social media on the heat warning and Help for When It's Hot resources.
- Mult Co Health Officer shares the message to get inside and cool off emphasizing that COVID precautions are secondary to staying cool.

Thursday, June 24

Max temperature on Thursday, June 24 is 89 degrees.

- Emergency Medical Services and Emergency Departments are already reporting a high volume of patients affected by the heat.
- Mult Co decides to open five library locations as cooling spaces Saturday through Monday.
- The Joint Office of Homeless Services distributes cooling center signup opportunities to its provider networks.

Friday, June 25

Max temperature on Friday, June 25th is 95 degrees.

- Monday's forecasted temperature increased to at least as hot as Sunday.
- Mult Co opens three cooling centers. Locations include the Oregon Convention Center, Arbor Lodge in North Portland, and the Sunrise Center in Rockwood.
- Mult Co Communications publishes social media in five languages with cooling center and cooling space locations.
- The Oregon Convention Center expands capacity to accomodate 300 guests.

Saturday, June 26

Max temperature on Saturday, June 26 is 108 degrees.

- Cooling centers receive additional supplies to mitigate heat related illness for guests (including coolers with ice for water, cooling towels, hydration packets, and pet supplies).
- The County requests that American Red Cross provide additional meals, shelter supplies, and staff.
- U.S. Sen. Ron Wyden visits the Convention Center, speaks to press.
- County Communications issues sector specific guidance and social media for outdoor workers, children, elders and pets.

Sunday, June 27

Max temperature on Sunday, June 27 is 112 degrees.

- Mult Co libraries open four more branches, for a total of nine libraries operating as cooling spaces.
- The Oregon Convention Center expands capacity again, allowing up to 450 guests.

Monday, June 28

Max temperature on Monday, June 28 is 116 degrees.

- The County decides to keep 24-hour cooling centers open through Wednesday, June 30.
- All Portland Parks activities are cancelled today, including summer camps and pools.
- TriMet suspends all train service until Tuesday morning.

Tuesday, June 29

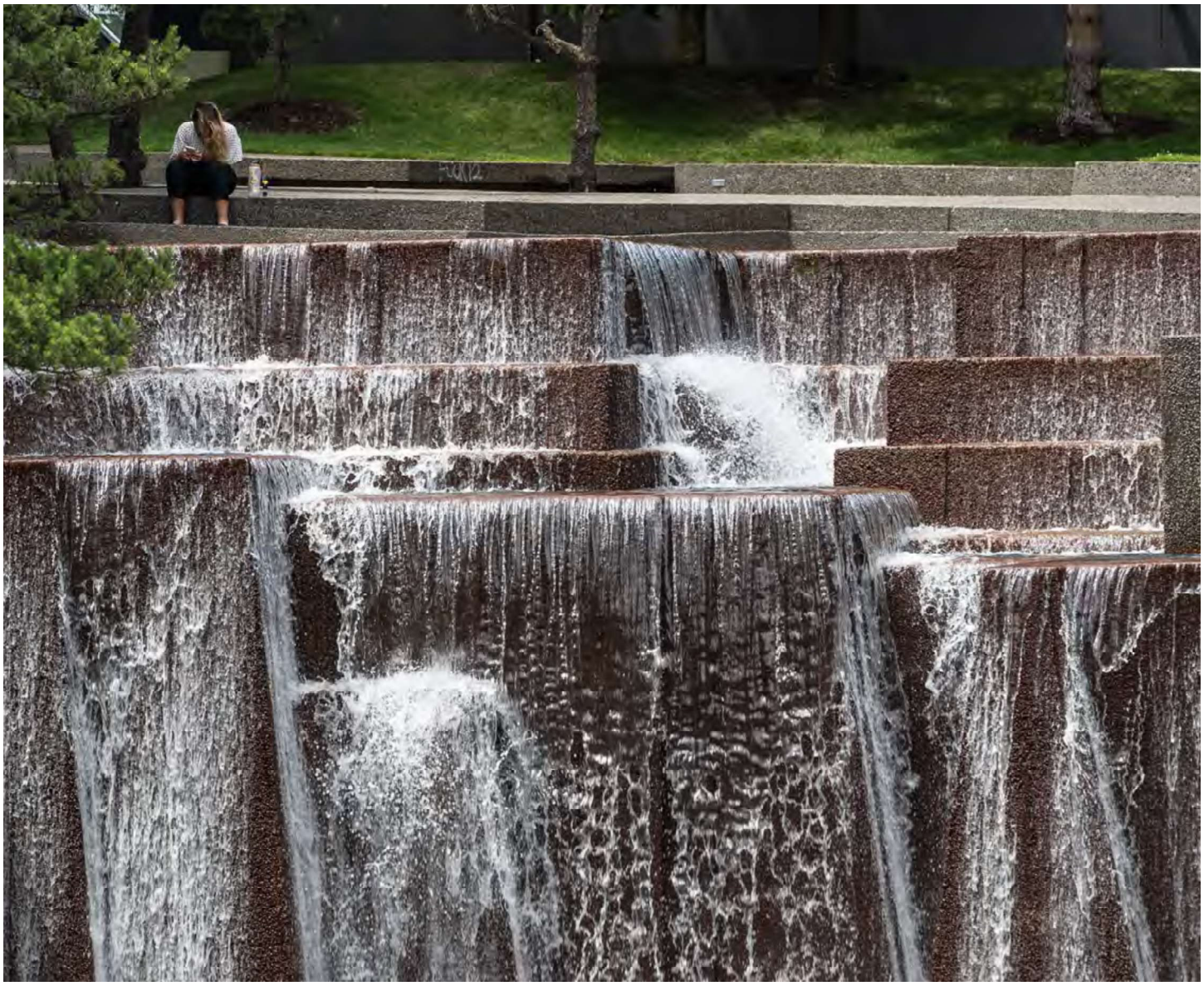
Max temperature on Tuesday, June 29, is 93 degrees.

- Mult Co decides to keep library locations open as cooling spaces for the public with modified hours through July 2.

Wednesday June 30

Max temperature on Wednesday, June 30, is 94 degrees.

- Cooling centers close 9 a.m.



Lessons and Action Steps

Cooling Interventions

Multnomah County has a statutory responsibility[9] to perform emergency management functions. This responsibility includes supporting our cities, unincorporated areas, and other governmental and community-based partners in their efforts to provide mass care and sheltering. Multnomah County follows the Federal Emergency Management Agency's Emergency Support Function 6 (ESF 6) framework to provide support for mass care, emergency assistance, temporary housing and human services during disasters.

In any emergency that calls for mass care and sheltering, our goal is to ensure safe, accessible, welcoming and life-saving services for our communities. During heat events, the County supports our cities and unincorporated areas to implement cooling interventions including, but not limited to, operating and supporting the operation of Cooling Shelters and Cooling Spaces, and providing cooling resources to the community.

9 Oregon Revised Statutes: https://oregon.public.law/statutes/ors_401.305

During the June 2021 heat wave:

- Three Cooling Shelters served a total of 1,400 overnight guests and provided 6,330 meals.
- Nine libraries served as Cooling Spaces.
- The County coordinated the work of nearly 100 outreach teams, mutual aid groups and community volunteers; those organizations distributed 14,000 cooling towels, 32,000 electrolyte packets, 8,000 containers of sunscreen, 4,500 hygiene kits, 67,000 water bottles and several hundred box fans to community members.
- Cascadia Behavioral Health, Project Respond and Multnomah County's Behavioral Health Division provided behavioral health support in the Cooling Shelters.
- Twenty-five physicians, nurses and paramedics from the Medical Reserve Corps, as well as 20 nursing students from Concordia University, provided medical support.
- Cooling Shelters were staffed by nearly 350 general staff and coordinators, including 155 County employees, 129 Neighborhood Emergency Response Team volunteers, 45 volunteers from the general public, 18 City of Portland employees and one Portland Public Schools employee.
- Vaccinations and vaccine education were offered at the Oregon Convention Center and Arbor Lodge Cooling Shelters.
- Multnomah County Animal Services provided a range of supports for pets in the Cooling Shelters, including 35 crates, 18 bowls for food and water, 40 leashes, 250 pounds of dog food, and 80 pounds of cat food.

As the heat event unfolded, temperatures reached highs that were more extreme than originally forecast, creating a community need that overwhelmed the County's planned response. Historically, the County's Cooling Centers have attracted no more than 50 guests, across all sites. However, within hours of Cooling Shelters opening June 25, approximately 60 guests arrived at just one of the three locations. While the County had researched and implemented the most effective evidence-based interventions for extreme heat, the magnitude of this event stretched our capabilities.

The County projected it could safely operate three Cooling Shelters safely with the staffing available. A strategic conversation with cities and unincorporated partners regarding community assets and needs did not result in the identification of additional locations. Community-based organizations and service providers expressed feeling underutilized and a desire to be more engaged in the planning and response process going forward.

The June 2021 heat event highlighted three primary areas that will improve our ability to support cooling interventions and other emergency interventions.

Action Steps

Increase the pool of potential Cooling Shelters, Centers and Spaces

- Work with Metro, cities, school districts, higher education institutions and unincorporated areas across Multnomah County to identify additional facilities and/or outdoor areas that could be available as Cooling Shelters, Cooling Centers and Cooling Spaces, embedding equity and epidemiology into the method for determining locations of facilities.
    - Formalize the critical role of Multnomah County libraries as respite sites during emergencies, including hot weather. Increase hours of operation during weather emergencies.

Build more capacity to support cooling interventions

- With a team of County leaders, develop additional strategies to support all-hands-on-deck emergency responses, including incorporating emergency response roles into job profiles, encouraging flexible staffing models and offering additional support for managers.
- Enhance support capacity for partners who step forward to open Cooling Centers or Cooling Spaces, including technical assistance and/or additional resources.
- Host additional pre-event refresher training webinars to help prepare new volunteers and staff for their Cooling Shelter and Cooling Center work.
- Expand and increase learning and training opportunities for all County staff.
    - Update training for staff who support Cooling Shelters and Cooling Centers, using a multidisciplinary operations team approach.
    - Increase the number and accessibility of disaster resiliency trainings to assist County staff and their loved ones to become better prepared for their critical role as a safety net for our community.
    - Incorporate an introduction to the County's emergency response role in new employee orientation.
- Improve safety in Cooling Centers and Cooling Shelters through a reexamination of current safety guidelines, improved communication of guest expectations and training on trauma-informed de-escalation practices.
- Improve administrative capability and capacity to ensure we have adequate staffing to manage the scheduling and assignments of duties during an emergency. Stakeholders in the June heat event identified a gap regarding having Cooling Shelter staff with the right skill sets, such as behavioral health training and management experience. This action item seeks to address such gaps.

Develop strategies to help people stay safe in place

As the tragic deaths of more than 60 people demonstrates, Cooling Shelters and Cooling Centers don't work for everyone who is at risk. Even as we work to identify additional and more easily accessible options for Cooling Shelters and Cooling Centers, efforts to help people stay safe and cool in place must also be enhanced. Several methods will be explored:

- With the help of community members and partner agencies, including culturally specific and culturally responsive organizations, we will determine what supports will help keep people safe in their homes and then develop materials and/or training to provide to those who check in on people at greatest risk.
- Enhance door-to-door and other types of outreach efforts by exploring coordinated approaches to track these activities. Work with cities, community-based organizations and unincorporated areas to create a collaborative system for wellness checks that includes a menu of resources for those hoping to help neighbors and loved ones.
- Ensure building managers have appropriate plans and training to respond to emergencies, including extreme heat events.
- Scale up existing partnerships, programs and policy efforts to install cooling systems in low-income housing, focusing on climate-neutral options, such as heat pumps. This could include expanding initiatives within the Department of County Human Services' Weatherization Program, which aims to support people with lower incomes by making their houses more energy efficient, comfortable, healthy and safe.

Communications and Outreach

Communication plays a critical role in an emergency response. Multnomah County has a responsibility to issue timely and accurate information to the public via our call centers, website, social media, media releases, media interviews and Flash Alerts, and through our partners. During any emergency, our communications goals are simple: inform residents about risks and provide practical information about actions they can take and the resources available to them.

The County used the time after the May 28 coordination call to refresh the "Help for When it's Hot" website. This update included updating the site's downloadable resources and checking an interactive map of cooling locations to ensure it was operational and ready for input from partners. On June 23, the County issued a media release with the message that the forecasted heat posed a life-threatening emergency and that people should stay indoors or make a plan to get somewhere cool. We encouraged community members to identify others who might need help. We also included information about Cooling Shelters and Cooling Spaces, symptoms of heat illness, and the Health Officer's advice that outdoor event organizers postpone or cancel events to keep people safe.

In addition to the initial media release, the County worked with media, agency and organization partners to launch an effort to underscore the seriousness of the heat forecast, and to get as much life-saving information to people as possible. This included:

- Creating and posting 27 graphics on warnings, heat stroke, and at-risk populations like kids, seniors and outdoor workers. These were concise, plain-language messages intended for sharing on social media for the broadest possible audience.
- Translating 12 graphics into languages other than English and making these available online for download and printing by Cooling Shelter operators; these materials were also shared with nonprofit partners.
- Creating and posting seven heat-warning videos that were also shared with media.
- Writing seven media releases and stories for the County's "Help for When it's Hot" webpage.
- Posting more than 130 safety messages across our social media platforms. We posted in English, Chinese, Spanish, Russian and Vietnamese.
- Working with local, national and international media to schedule and conduct more than 150 interviews in seven days.
- Conducting direct outreach about heat risk to pregnant County clients and clients with infants via text, reaching 12,000 contacts in multiple languages.
- Our Emergency Operations Liaisons unit — a group of internal and external partners who over this last year have served as critical connectors between various industries, sectors and communities within Multnomah County — reached out to their networks and encouraged them to make phone calls to at-risk community members about available resources and to answer questions.
- 211info — a critical community resource that many in our community depend upon to get help when they need it — fielded over 1,000 calls to provide information to callers about Cooling Shelters, Cooling Spaces and transportation options.

Amid those extensive efforts, there remain key areas to strengthen our communication and outreach response for the next emergency and beyond.

Even though 211info served as a critical 24-hour clearinghouse for Cooling Shelter information and transportation assistance in Multnomah County, at the time of the June 2021 extreme heat event, 211info's existing operating procedures were not aligned with the catastrophic heat event response. During this event, 211info dropped more than 750 calls, and callers reported long waits and inaccurate information on the automated line.

As is the case with all emergencies, information also changed quickly, challenging our communications response. As new Cooling Shelters and Cooling Spaces opened with different support services available, rapid updates were made to our online and downloadable materials, but limited access to translators delayed our ability to quickly provide this information in multiple languages.

Given Multnomah County's historically temperate climate, many residents, until this event, had no frame of reference for the toll extreme heat can take or how deadly it can be. Even with a clear message about the risk, many people may not fully understand the body's vulnerability to extreme and prolonged heat. Moving forward, Multnomah County is committed to deepening and expanding our methods of reaching our community with critical information during an emergency, using both technology and direct outreach.

Action Steps

Amplify heat risk messaging

- Use community notification systems to amplify messaging. People often engage in message confirmation before taking action[10], and adding this additional platform will help provide another avenue for accurate information.
- Educate the public about heat risks, including launching seasonal awareness messaging around extreme heat, working with partners in the media, and focusing on culturally specific channels.

Enhance outreach strategies

- Increase our capacity for focused door-to-door outreach. In collaboration with our partners, create wellness check training that incorporates safety skills as well as strategies for organizations, neighbors and loved ones to participate more fully in life-safety operations during emergencies, including heat incidents.
- Work with the Emergency Operations Liaisons unit to create more opportunities for two-way communication and engagement in emergency response efforts.
- Use lessons learned from this heat event to rebuild the Preparedness Advocates program, a team of bilingual community members trained in providing emergency response and preparedness presentations to culturally specific communities. Include language support during emergencies as a key role and responsibility, a shift that will help ensure the ability to create culturally specific and appropriate communications.

Build our capacity to communicate

- Train more County staff as public information officers to expand the pool of communications staff during emergencies.

Improve communications coordination with partners

- Use a Joint Information System framework, a standard organizational structure used in emergency management, to allow communications specialists from the County and partner agencies to coordinate, develop and deliver messages during an event.
- Continue to work with 211info on emergency response process improvements, including specific deliverables around operations response and communication needs.
- Ensure Multnomah County and the City of Portland have the capacity and capability to backup 211info if call volumes increase rapidly and surge capacity is needed to minimize the potential for dropped calls.

10 CERC: Psychology of a Crisis. "We look for additional information and opinions" page 4: https://emergency.cdc.gov/cerc/ppt/CERC_Psychology_of_a_Crisis.pdf

Partnerships and Planning

The value of interagency relationships and close coordination leading up to and during disasters cannot be overstated. Simply put, no single agency or organization can adequately respond to emergencies and disasters alone.

Multnomah County is committed to both being part of a robust community response in a heat emergency and addressing the root causes that contribute to the frequency and severity of these heat events.

As we learn from the June 2021 heat event and prepare for future heat emergencies, Multnomah County is working with leaders of our cities, schools and other partners to identify opportunities for greater collaboration. This includes the potential for additional public facilities that could serve as Cooling Shelters and Cooling Centers, shared staffing strategies that can support these efforts, and potential policy and program changes that will better respond to community needs. Building that capacity and commitment now will further improve our ability to respond in the future.

As the coordinator of our community-level response and the convener of our partners, Multnomah County is also committed to making internal changes that improve our ability to work together and facilitate getting information and resources to residents as quickly and equitably as possible.

Action Steps

Strengthen partner coordination

- Examine roles and responsibilities, and pursue formal agreements that guide coordinated preparedness, mitigation, response and recovery between our public partners, including cities, unincorporated areas, community-based organizations and private industry.
- Formalize agreements with partner agencies around specific actions and policy changes. Examples include but are not limited to:
    - **TriMet**: Conduct policy-level discussions with TriMet about ways to make buses and trains more accessible during catastrophic heat so people have another way to get cool and stay cool.
    - **211info**: Complete an emergency activation addendum to the State's contract with 211info that details deliverables and expectations.
- Actively engage internal and external partners in discussions regarding processes and tools that will increase the effectiveness of our coordination. During the June 2021 heat event, daily coordination calls were used to obtain verbal agreement regarding roles, responsibilities and commitments between partner organizations. Notes from the meetings outlined these agreements and were shared with participants via email. Requests for resources or support were also most often made verbally during the calls, without a formal approval process. This system provided flexibility and speed; however, using more formal Emergency Operations structures may provide greater clarity for planning communications and for tracking commitments and actions.

Strengthen County planning efforts

Update current standard operating thresholds to increase our advance planning window, and continue to perform annual reviews to update thresholds based on lessons learned from previous seasons.

Convene a cross-disciplinary, multi-jurisdictional team to review policies, plans, and staffing and training needs related to mass care and sheltering. This team will include, but not be limited to, the Office of Diversity and Equity, the Department of County Human Services, the Health Department, the Joint Office of Homeless Services, Multnomah County Emergency Management, and representatives from cities and unincorporated areas.

Expand heat-mapping efforts in east Multnomah County to better understand where resources need to be deployed during extreme heat.

Facing the Climate Crisis

The June 2021 heat event would have been virtually impossible without human-caused global warming and climate change. Researchers estimated the extraordinary temperatures were a once-in-1,000-year event. However, if current greenhouse gas emissions continue, an event this extreme could happen every five to 10 years by the year 2040.[11] Other impacts of the climate crisis are also being felt across Oregon and Multnomah County, including record drought conditions, wildfires and smoke. Hotter and drier summers and winters, with more intense storms, mean that there is less snow in the mountains and that forests dry out earlier in the summer, leading to more wildfires, more smoke, worse air quality, more extreme heat, and a variety of other conditions that will affect people's health and wellbeing.

Dramatic negative impacts
of the climate crisis that seemed far off
are hurting our community today.
This is a moment for the County
to redouble our efforts to both mitigate
and prepare for the worst effects
of climate change.

The County has had a longstanding commitment to addressing climate change by leveraging our regulatory, programmatic and agenda-setting role to advance equitable climate solutions. The County partnered with the City of Portland to jointly adopt the 2001 Local Action Plan on Global Warming. In 2009, the County and Portland adopted a Climate Action Plan, establishing long-term goals for reducing carbon emissions — 40% below 1990 levels by 2030 and 80% below 1990 levels by 2050. The current iteration of the Climate Action Plan was adopted in 2015, expanding the focus to include climate adaptation planning, public health and social equity.

While the majority of actions from the 2015 Climate Action Plan were completed or on track to be completed by 2020 (77%), some of those actions need ongoing implementation. This is especially true for actions that decrease emissions and help the community become more climate resilient. Examples include home weatherization, home electrification with heat pumps that efficiently heat and cool, and neighborhood tree planting.

In 2017, the Multnomah County Board of Commissioners and the Portland City Council adopted more stringent goals of eliminating all carbon emissions communitywide by 2050 and decarbonizing electricity supplies no later than 2035. These actions have resulted in emissions from Multnomah County operations dropping by 65% since 2007 — the baseline year for reporting. Communitywide, Multnomah County emissions have decreased 19% below 1990 levels. However, transportation emissions have increased in recent years.

Multnomah County's Health Department has been a longtime leader in understanding the connections between climate change and population health. Since 2010, Multnomah County has received funding from the Centers for Disease Control and Prevention, the Oregon Health Authority,

11 World Weather Attribution. Western North American extreme *heat virtually impossible without human-caused climate change.* July 7, 2021.

Learn more about our climate and health work

Climate Action Plan Final Progress Report, 2020

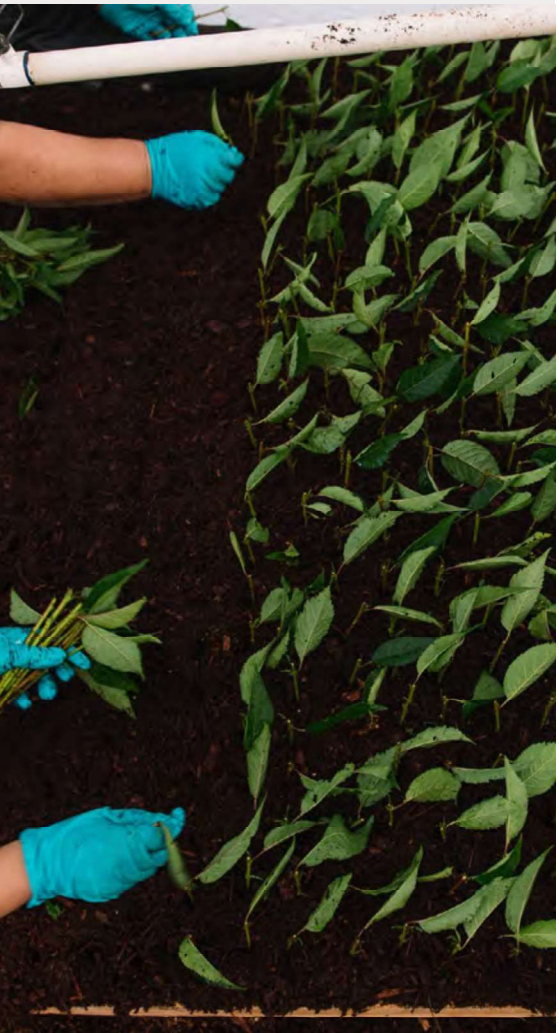
Climate Action Plan Progress Report, 2017

Climate Action Plan, 2015

Climate Change Preparation Strategy, 2014

Climate Change Preparation Strategy: Risks and Vulnerabilities Assessment, 2014

Climate Change Preparation Plan, 2013



and the Public Health Institute to develop capacity in this area. The department's Environmental Health unit has been involved in advocacy, developing legislation and advising on state rules related to climate. In 2020, the Health Department helped lead a legislative "Call to Action on Climate, Health, and Equity.[12]"

Led by the Multnomah County Office of Sustainability, the County is updating the 2015 Climate Action Plan through a community-based process called Climate Justice by Design. Our focus on climate justice is grounded in the County's responsibility to support and protect the most vulnerable people in our community who are most at risk of experiencing disproportionate impacts and harms of climate change.

Action Steps

- Pursue policies to accelerate the decarbonization of Multnomah County's electricity supply. This means getting Multnomah County's electricity supply for all customers to be 100% renewable and free of carbon pollution by 2035 or sooner.
- Co-develop — in partnership with organizations based in the communities of color that have experienced the first and worst consequences of climate change, a new Climate Action Plan through the Climate Justice by Design process.
- Prioritize state-level policy advocacy around green building codes, transitioning from fossil fuels and other harmful policies to promote climate stability.
- Continue to build capacity at the County for subject matter expertise on the intersection of climate and health.
- Scale up current Multnomah County efforts to increase the tree canopy in urban heat islands located in the county.
- Find strategies and funding to scale up low-income household weatherization efforts, particularly in east Multnomah County.
- Establish a strategy for electrifying Multnomah County's fleet, and pursue policies that set Multnomah County, as a government entity, on a path toward ending its own reliance on fossil fuels.
- Adopt strategies/policies that help Multnomah County further reduce the carbon footprint of our emergency response.

12 Oregon Public Health Association, Call to Action on Climate, Health, and Equity: https://www.oregonpublichealth.org/call-to-action-for-climate--health--and-equity

Conclusion

Each of the actions described above will require thoughtful and dedicated work within the County, with our partners and with the communities we serve. And there is more to the story. We await the regional findings from the Centers for Disease Control and Prevention on heat deaths, as well as our own After-Action Report. In the meantime, we will continue to provide safe, accessible, life-saving services to our community. To learn more about what you can do to stay cool and support others to do the same, visit our "Help for When it's Hot" webpage.

Again, we want to make clear: Our hearts go out to everyone in our community who lost a loved one to the extreme heat in June. We are committed to doing all we can to keep people safe in future heat crises.

Appendix A

Heat Call Operational Briefing - Participating and Invited Organizations

Organizations Briefing

City of Gresham

City of Portland Bureau of Emergency Management

Joint Office of Homeless Services (JOHS)

Multnomah County Chair's Office

Multnomah County Communications Office

Multnomah County Department of Community Services (DCS)

Multnomah County Department of County Assets (DCA)

Multnomah County Department of Community Justice (DCJ)

Multnomah County Health Department (HD)

Multnomah County Department of County Human Services (DCHS)

Multnomah County Library

National Weather Service

Portland General Electric

TriMet

Additional Organizations Participating / Invited

American Medical Response (AMR)

American Red Cross

City of Fairview

City of Maywood Park

City of Portland Bureau of Fire and Rescue

City of Troutdale

City of Wood Village

Corbett Fire

District Attorney's Office

Metro

Multnomah County Attorney

Multnomah County Circuit Court (4th Judicial District)

Multnomah County Department of Community Justice (DCJ)

Multnomah County Department of County Management (DCM)

Multnomah County Office of Community Involvement

Multnomah County Office of Diversity and Equity (ODE)

Multnomah County Office of Government Relations

Multnomah County Office of Sustainability

Multnomah County Sheriff's Office (MCSO)

Northwest Natural Gas

Oregon 211info

Oregon Department of Environmental Quality

Oregon Office of Emergency Management

Oregon Volunteer Organizations Active in Disasters (ORVOAD)

PacifiCorp

Regional Disaster Preparedness Office

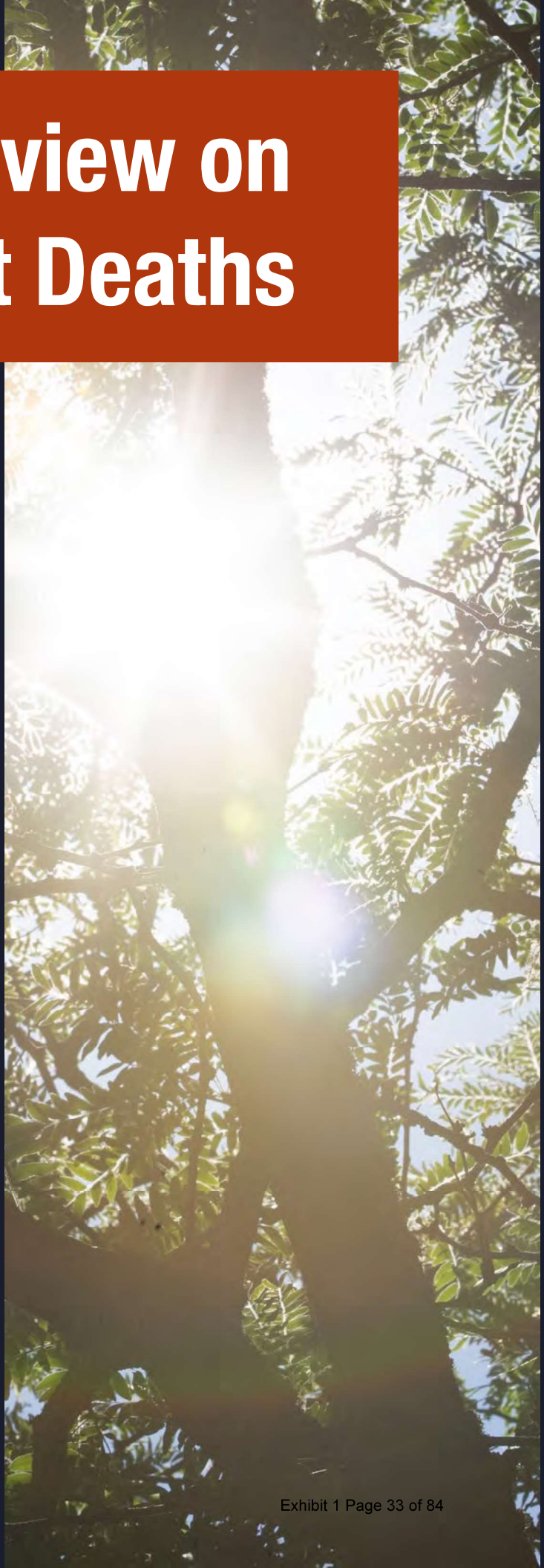
Appendix B

Organizations That Assisted with Resource Distribution

Alliance/PPOP
AS IS Church
Beacon Village
Because People Matter
Blanchet House
Bridges to Change Inc.
Creating Conscious Communities with People Outside - C3PO
Care Bloc
Cascadia Behavioral Health
Catholic Charities
Clean Start
Community's Non-Profit
Cool Camp Collective
Clackamas Service Center - CSC
Cultivate Initiative
Do Good Multnomah
Ethiopian and Eritrean Cultural and Resource Center
Feed the Mass
First United Ministry of Christ
Food For the Community
Free Hot Soup
Fresh Air PDX
Good Neighbor Project
Grace Church PDX
HOPE Team
Hygiene 4 All
Independent Medics
Industrial Workers of the World
Janus Youth
JOIN
Matzah Bloc
Meals on Us PDX
Move Food
Mutual Aid Alliance
Native Wellness Institute
NAYA
Neighborhood associations
New Avenues for Youth
NW Enforcement of Hospitality
Operation Nightwatch
Oregon Harbor of Hope
Outside In
Outside the Frame
Partners in Prayer
Portland Bureau of Transportation
People's Harm Reduction
Play Grow Learn
Portland Downtown
Portland Freedom Fund
Portland Mutual Aid Network
Portland Rescue Mission
Portland Street Medicine
Portland Street Response
Potluck in the Park
Project Homeless
Project Respond
Rahab's Sisters
Rapid Response
Right 2 Survive
Rose Haven
Salvation Army Female Emergency Services - SAFES
Service on the Street
Sisters of the Road
St. Johns Safelight
Straightway Services
Stroll
The People's Depot
Transition Projects
Trash for Peace
Union Gospel Mission
Unism Church
Urban League of Portland
Victory Project PDX
Waste Not Food Taxi
We Shine
William Temple House
Western Regional Advocacy Project - WRAP

EXHIBIT B

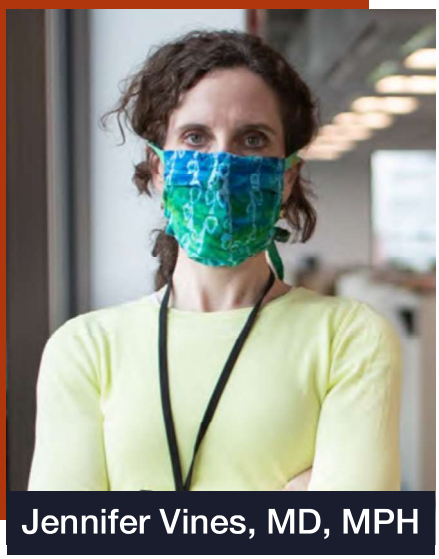
Preliminary Review on Excessive Heat Deaths



Multnomah County
June 2021

Multnomah County

Jessica Guernsey, MPH



Jennifer Vines, MD, MPH

The heat dome that settled over Multnomah County and the Portland metro area from June 25 to June 28, 2021, created an extreme heat event that occurred both earlier in the summer, before residents naturally acclimate to warmer temperatures, and at a prolonged intensity never experienced before. High daytime temperatures reached triple digits for three days, peaking at 116° F at Portland International Airport on June 28, with little of the overnight cooling the region has historically depended upon. The magnitude of the heat was not just unprecedented for the temperate Pacific Northwest, but it also was exceedingly rare for most of the United States.

This heat resulted in the deaths of at least 54 Multnomah County residents. Most of those who died were older, lived alone and had no air conditioning. Most were white, and most were men.

While the County responded with the full set of public health interventions — intensive communication, outreach and public cooling spaces — we are humbled by the death toll and are committed to learning all we can about who succumbed and why.

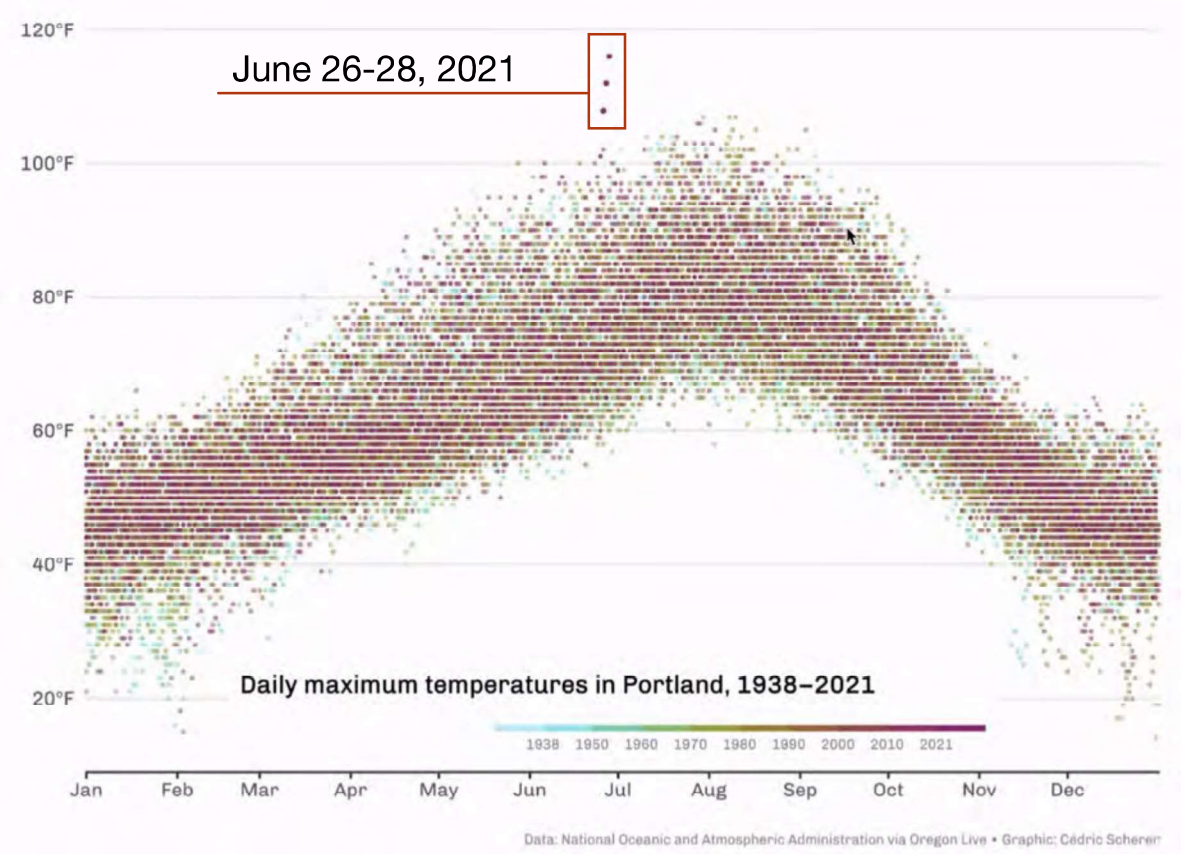
We also want to acknowledge the dedication of death investigators from the Multnomah County Medical Examiners Program who responded in person throughout this mass casualty event, then worked with Public Health to analyze and characterize what happened in order to share these findings with the community.

The following report is a preliminary look at confirmed deaths due to hyperthermia (which literally means “excessive heat”). We expect numbers to change and our understanding of this event to evolve.

What is clear even now is that climate disruption is making extreme heat events more frequent, more intense and longer in duration.

In a little more than 50 years, within the lifetimes of our children, the Centers for Disease Control and Prevention projects Multnomah County will experience 38 days over 90 degrees each year, far surpassing the current record of 29 days set in 2015.

Portland Daily Maximum Temperatures



Nighttime heat waves have an even greater influence on human health than daytime heat waves and, according to the National Climate Assessment, nighttime heat waves have increased in frequency in the Northwest since 1901.

Over the last several years, Multnomah County developed an extreme heat response plan with a range of interventions meant to help the community prepare for events of differing severity. But no one predicted a heat event of this magnitude at this time. We used every intervention in our plan and several that we improvised in short order.

Yet as the deaths recorded here make clear, the devastating effects of climate disruption have arrived much faster than predicted. Our community must come together around both shorter- and longer-term strategies, from investing in cooler indoor spaces to reducing greenhouse gas emissions. At the County, we will refine our response plan to include a broader range of partners and interventions for more severe events and the possibility of multiple hazards happening at the same time. This convening and preparation work will require dedicated staff to research science-backed interventions, review available community resources, build strategic partnerships, and then revise our response protocols accordingly.

In solidarity,

Jessica Guernsey, MPH
Local Public Health Administrator

Jennifer Vines, MD, MPH
Health Officer

Data: Source, Analysis and Limitations

As of July 9, the Multnomah County Medical Examiner's Office identified 71 deaths in which the suspected cause of death is hyperthermia. Of those, 54 had been formally ruled hyperthermia deaths.

The following is an analysis of those 54 confirmed cases.

Data Source

The Oregon State Medical Examiner (OSME) maintains a database of all deaths investigated under its jurisdiction. County death investigators gather information about residence and housing status and important details from scene investigations and interviews with relatives and social contacts. That information allows the State Medical Examiner's Office to certify cause and manner of death.

According to ORS 146.090, the Medical Examiner investigates and certifies the cause and manner of all human deaths that are:

a. Apparently homicidal, suicidal or occurring under suspicious or unknown circumstances;

b. Resulting from the unlawful use of controlled substances or the use or abuse of chemicals or toxic agents;

c. Occurring while incarcerated in any jail, correction facility or in police custody;

d. Apparently accidental or following an injury;

e. By disease, injury or toxic agent during or arising from employment;

f. While not under the care of a physician during the period immediately previous to death;

g. Related to disease which might constitute a threat to the public health; or

h. In which a human body apparently has been disposed of in an offensive manner.

For the period beginning June 25, 2021, we extracted from the database deaths suspected as hyperthermia, or excessive heat, as well as narrative description and incident/death location information to assist in categorization and mapping.

Case information for all investigated deaths under Medical Examiner jurisdiction was extracted from the corresponding database. Seventy-one deaths were flagged as suspected hyperthermia and underwent additional review. Two reviewers independently assessed death narrative reports, supplemental information, and address information for each case.

Data Limitations

The findings presented in this report are considered preliminary. For example, information related to housing may change as additional investigation is required to establish whether the person met the classification of homelessness using definitions set by the U.S. Department of Housing and Urban Development or U.S. Department of Health and Human Services.

Many findings may change as case investigations continue and toxicology results return in the coming months. Some cases may also be determined to have another cause of death. Additional cases may be discovered. The County will refine and produce a final report when that work is complete.

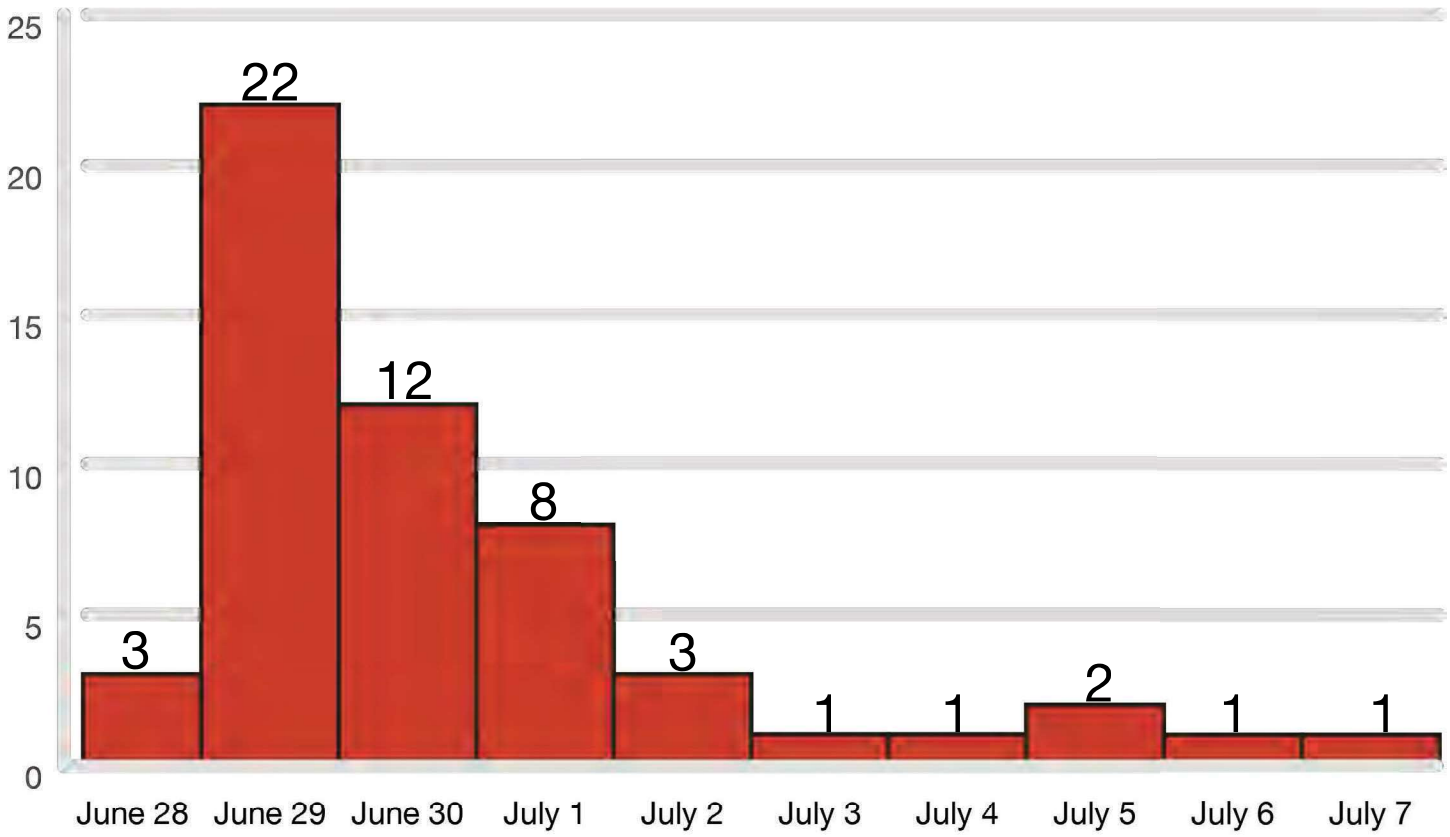
Preliminary Findings

Reported Date of Death

The National Weather Service issued an excessive heat warning for the Portland Metro region beginning Friday, June 25, through Monday, June 28. The first three reports of possible hyperthermia deaths were reported to the Multnomah County Medical Examiner on Sunday, June 27; those cases are still pending. Three confirmed deaths were reported June 28, with the majority reported June 29 and after. Multnomah County Medical Examiners continued to respond to reports in the following days.

Confirmed cases were reported to the Multnomah County Medical Examiner on the following dates:

Reported Date of Death



Note: Date of death reported to Multnomah County Medical Examiner's Office

Age, Race and Gender

Most of those who died were older adults — the youngest was 48, and the oldest 97; the average age was 70. All but four people were identified in preliminary investigations as white.

Age

Age	Number (%)
45 to 59	10 (18.5%)
60 to 69	18 (33%)
70 to 79	16 (30%)
80+	10 (18.5%)
TOTAL	**54 (100%)**

Race

Race	Number (%)
White	50 (92%)
African American/Black	2 (4%)
American Indian/Alaskan Native	1 (2%)
Asian	1 (2%)
TOTAL	**54 (100%)**

Sex

Sex	Number (%)
Male	34 (63%)
Female	20 (37%)
TOTAL	**54 (100%)**

Location: Housing Type

The vast majority of deaths occured in the decedent's own residence, more than half of which were multifamily dwellings. Of the people who succumbed to the heat in multifamily dwellings, 45 percent lived on an upper floor (floor 3 or higher) of that building.

Of all those who died in their homes, 78 percent lived alone.

At least four people died in apartment buildings charged with caring for vulnerable people. Three people died in apartment buildings owned and managed by Home Forward. And one person died in a building owned and operated by Central City Concern.

Two individuals died in an independent senior living community. An earlier version of this preliminary report, released July 13, incorrectly described the facility as an assisted living facility. We regret the error.

Two people have been identified through an initial review of housing status as experiencing homelessness. Both were found in their vehicles. The number of cases may increase as case investigations continue and toxicology results return in the coming weeks and months.

Residence type among people who died of hyperthermia

Location	Number (%)
Multifamily*	29 (55%)
Single Family*	15 (28%)
Mobile Home, RV park, Automobile	10 (18%)
TOTAL	**54 (100%)**

Note: Housing type is where the individual permanently or temporarily resided at time of death, regardless of location of death

**Multifamily includes apartment buildings, SRO, hotels, duplexes, and single family home with attached apartment/ADU. Single family includes ONLY single family dwellings.*

Cooling

Lack of air conditioning was a key driver in mortality. Whereas about 80 percent of people in the Portland area have some level of air conditioning in their homes — and about 50 percent have central air — none of those who died had central air, and only eight people had a portable air conditioning unit in their home.

Of those eight individuals, at least seven had units that were unplugged or not working properly. In one case, for example, an individual did not use the unit out of fear it would catch fire. In another case, the portable air conditioning unit was found in use, but unable to keep up with the heat to sufficiently cool the home.

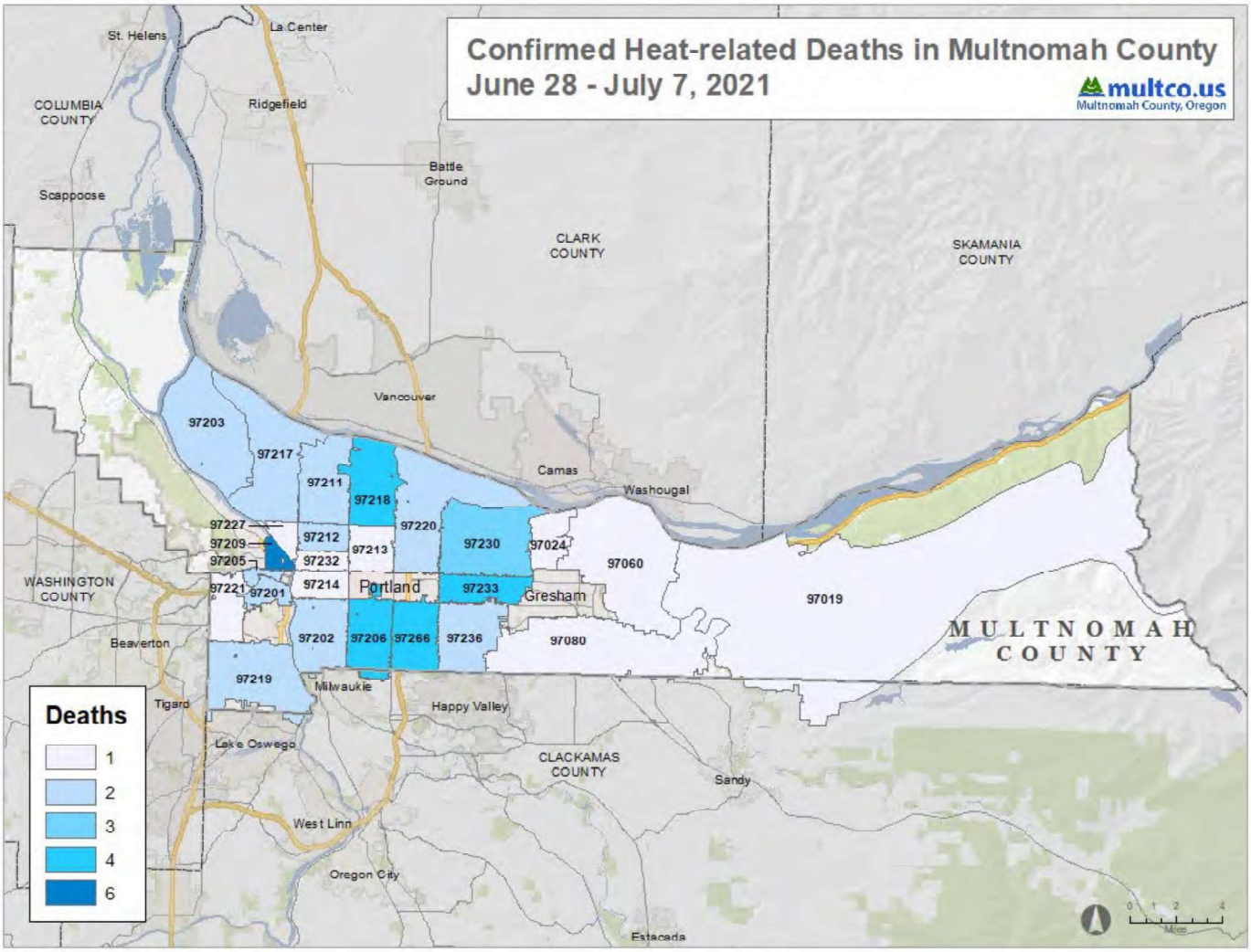
More than half of those who died had only a fan, which, at the outdoor temperatures reached during this event, can actually make the body warmer and dryer. At temperatures in the upper 90s, fans simply move hot air around; the breeze they produce must be cooler than body temperature to actually cool the body down.

Cooling Type in Housing

Cooling Type	Number (%)
Fan Only	28 (52%)
None	13 (24%)
Portable AC w/ or w/o Fan	8 (15%)
Unknown	5 (9%)
TOTAL	**54 (100%)**

Location: Geography

Deaths occurred in nearly every corner of Multnomah County, with at least one person succumbing in 25 of the County's ZIP codes. No ZIP code had more than six deaths. The map of heat-related deaths by ZIP code shows the primary location of residence for confirmed cases throughout the duration of the heat event. These counts are likely to change as more cases are confirmed.



Trend Over Time

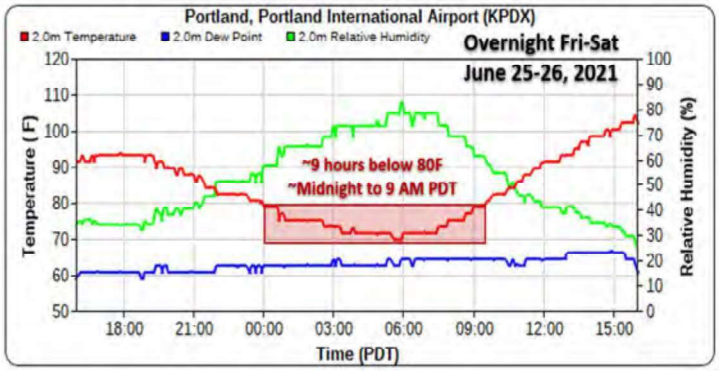
The June 2021 heat wave was so extreme that it was difficult to describe just how unusual it actually was.

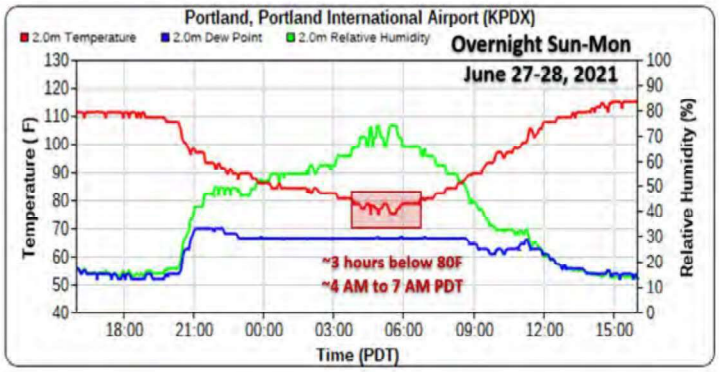
Temperatures jumped more than 30 points above average beginning Saturday, June 26, when the temperature registered 108 degrees at 5 p.m. The previous record high, 107 degrees, had been reached only three times: on Aug. 8 and 10, 1981, and July 30, 1965.

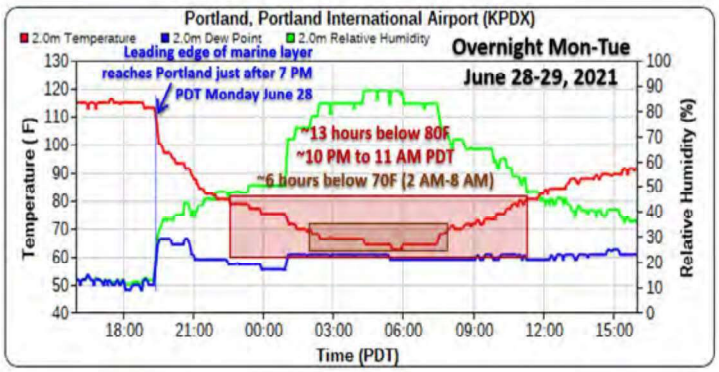
On Sunday, June 27, temperatures rose an additional 4 degrees, breaking the prior day's record. Then on Monday, June 28, the temperature at Portland International Airport registered 116 degrees, nearly 40 points above normal, with a 24-hour average of 96 degrees.

Warm overnight temperatures over consecutive days — when homes and apartments without air conditioning do not cool down at night — are a primary driver of heat-related illness, hospital visits and deaths during extreme heat.

In many instances, indoor temperatures didn't peak until as late as 11 p.m, and remained high all night long. According to the National Weather Service, this aspect of the event acted as a "force multiplier" to the extreme daytime temperatures.







Over the course of the heat wave and in the days that followed, Multnomah County Medical Examiners identified at least 54 people who were confirmed to have succumbed from the heat, with additional cases pending investigation and toxicology.

Prior to June 2021, Multnomah County had recorded only two hyperthermia deaths since 2010 — one each in 2016 and 2018. In fact, more people died from the June 2021 heat wave in Multnomah County than died from heat in the entire state of Oregon in the past 20 years.

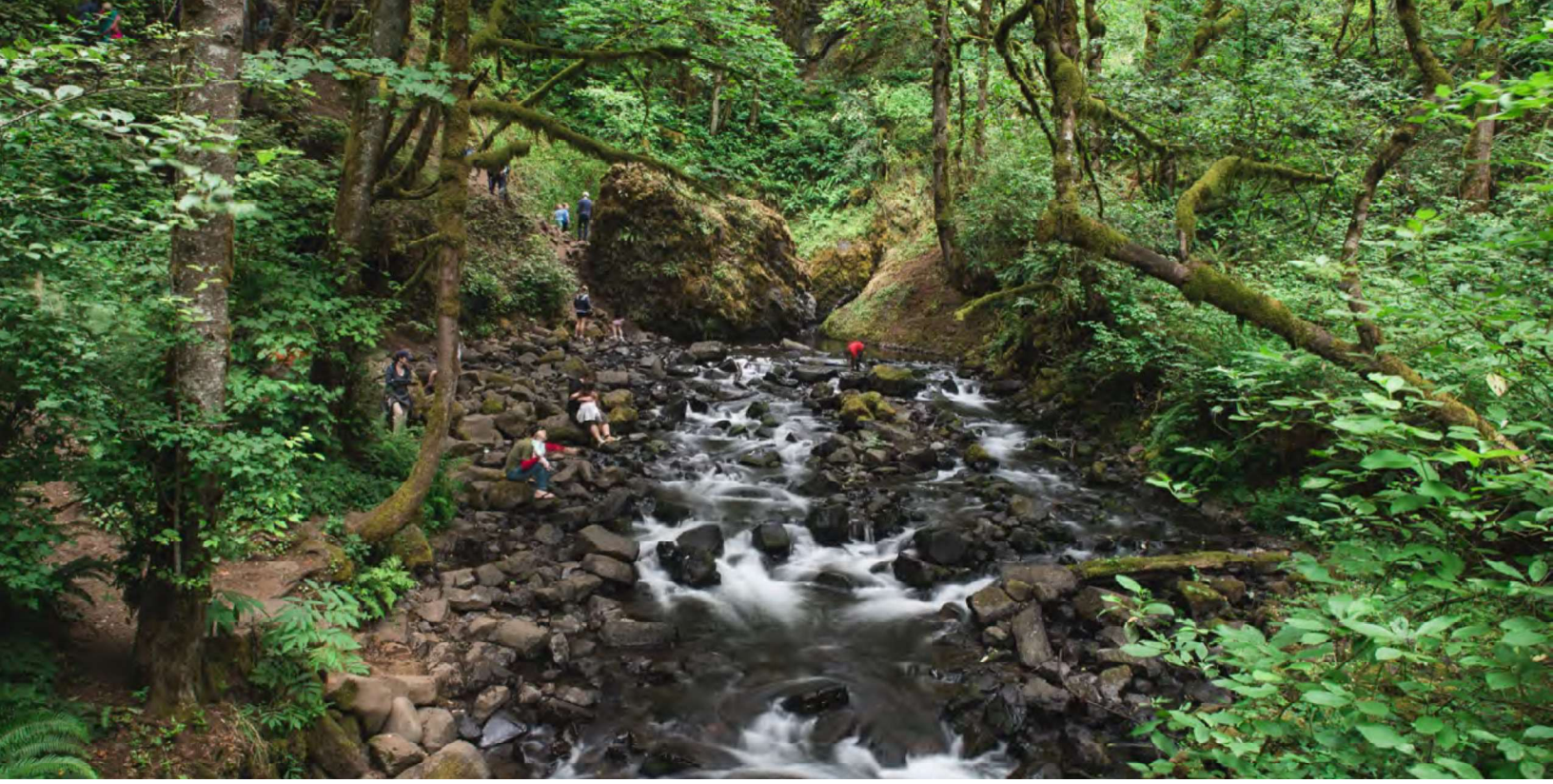
Multnomah County Environmental Health, in partnership with Washington and Clackamas counties, began tracking these deaths in a Regional Climate and Health Monitoring Report published in 2019. An update to that report is planned for later this year.

Taking Action

The Multnomah County Medical Examiner's Office will be actively working to finalize the heat death data as toxicology and housing information become available.

Multnomah County Emergency Management will also convene city, transportation and communication partners to identify short-term interventions in advance of further heat events this year, and to produce a more in-depth after action report to increase preparedness and resiliency.

To be clear, no amount of individual, community or County interventions will fully head off the dangers of a hotter and more unpredictable climate. But as we remember all those who died last month, we are committed to learning as much as we can to help our community prepare as best as it can for the future. And we will continue advocating for state and federal action to reduce carbon emissions.



Two families' stories

Lyle Crawford:

"It didn't occur to him he was going to die"

Lyle Crawford died in the house where he was born and raised, where he knocked elbows with his big sister at the dinner table, where he and an older brother cared for their aging parents, where he strung guitars in the garage, and where he tended his father's fruit trees.

Crawford, 62 and single, died alone, as a box fan churned scorching air through his little yellow home.

"I'm sure it didn't occur to him that he was going to die," said his sister, Donna Crawford, who lives in Richmond, Virginia. She was the only family he had, but it had been a month since they had spoken by phone.

"I hadn't talked to him. I wish I had," she said. "Why didn't I call him before? I feel horrible. I'm just going to have to feel that for a while."

Lyle attended Gresham High, where he loved his shop classes. Later, he became a welder. For much of his life he lived at home and cared for their mother, who had Alzheimer's. His one international adventure was a trip to South Korea leading up to the 1988 Olympics, while he served in the Oregon National Guard. But he trekked all through the trails, mountains and rivers of Oregon.

He was musically gifted, playing the banjo, guitar and ukulele. He loved fishing, although he could rarely afford the license. He did not use a computer and never bought a smartphone.

He used to insist, “I’m not a Luddite; I just don’t see the point.”

In 2001, the year their mother died, he launched a business making stringed instruments, building ukuleles. He was skilled, but too generous to earn a living. “If someone couldn’t afford to pay full price, he would simply drop the price,” Donna said.

Lyle wasn’t very social, keeping close to home, his sister said. But he was friendly, and enjoyed his casual interactions with people around town. He filled Donna in on the latest in his barber’s life, for example. But he had few close friends in his later years, and the pandemic isolated him further. Even Donna, who usually visited during summer breaks from her academic job, hadn’t come to visit in two years.

Donna called her brother late Saturday, June 26, the day temperatures reached 108 in Gresham. “I hope you’re doing OK in the heat,” she said into the home answering machine. She said she would be away the next day, but would check back in on Monday, June 28.

“I wasn’t totally surprised he didn’t call me back. Then on Monday I didn’t hear from him and I started to get a not-great feeling,” she said. She tried again the next day. “I’m worried about you,” she said into the machine.

She called a former girlfriend Lyle had stayed friendly with, to check on him. The house was shuttered and locked. That’s when Donna called Gresham police.

“He used to nag my father, ‘Couldn’t we get an air conditioner?’” Donna recalled. In his later years, Lyle couldn’t afford to buy one of his own. And he would have been too proud — and stubborn — to ask for help.

Donna wonders if she could have made a difference, even from 3,000 miles away.

If she had called before the heat started, she says she could have told him to go to the library, and read a book. But he probably would have answered, “That’s interesting,” she says, the thing he said whenever he disregarded someone’s suggestion.

“He would have answered the door if someone knocked, and that might have done it. An actual human being,” she said. “But how can there be enough human beings to go to the door of every older person?”

Jollene “Jolly” Brown:

“She didn’t want to be an inconvenience”

Jollene “Jolly” Brown lived alone, but she was just an eight-minute drive from her son Shane. Twice a week, he would come by her apartment, picking up groceries, helping with chores and taking his 67-year-old mother to her medical appointments.

Once a week, they would sit down for a meal and watch “The Masked Singer” on TV. Jolly Brown would talk during the show, and it drove Shane crazy. Now, he says, “all I want to do is hear her talking again.”

Shane last saw his mother Sunday night, June 27. He brought a swamp cooler over to help his mother, who had been in poor health and needed something to replace her broken air conditioner. The cooler didn’t work either. Jolly asked Shane to see if he could fix her air conditioner and bring it back.

The next morning, June 28, when Shane called to check in, she didn't pick up. He drove over and found her in her recliner, feet down as if she meant to stand up. Inside it was already 99.5 degrees.

"Maybe we need to get you a real air conditioner," Shane remembered telling his mother the night before. She shrugged it off. She said she would get through this heat wave, and then they could talk. After all, air conditioners were expensive and too heavy for an older person to carry.

"I'll be fine" she would say. "I'll get through it."

By then it was too late.

Shane said Jolly might have survived if she had taken up a friend's offer to stay with them during the worst of the heat. But she never wanted to impose, didn't want to be a bother. And she might have survived if she had a working air conditioner, her son said.

He said that's something to consider for those vulnerable older people without the means to buy a unit of their own.

"Especially people who aren't able to get to cooling spaces, or, like my mom, who didn't want to put people out, didn't want to be an inconvenience," he said.

Shane said Jolly kept to herself, struggling with her health and living on a meager income in her tiny studio apartment. But he said she never focused on her troubles.

"She had this optimism that things would work out."

She loved things like rose gold and opals, and Dolly Parton and Patsy Cline. Her favorite birds were puffins. And she loved "American Idol." She had one overarching goal — to be a good mom.

"She was just genuinely one of the best people I have ever known," he said. "She had that capacity of love, and when I needed her, she was always there."

Acknowledgements

Multnomah County Medical Examiner's Office

Multnomah County Health Officer

Multnomah County Public Health

Multnomah County Communications Office

National Weather Service

Special thanks to the families' of Lyle Crawford and Jollene "Jolly" Brown for sharing their stories.

Media inquiries

Multnomah County Communications Office

Julie Sullivan-Springhetti, Director of Communications
julie.sullivan-springhetti@multco.us
503-502-2741

Kate Yeiser, Communications Coordinator
kate.yeiser@multco.us
503-410-4524

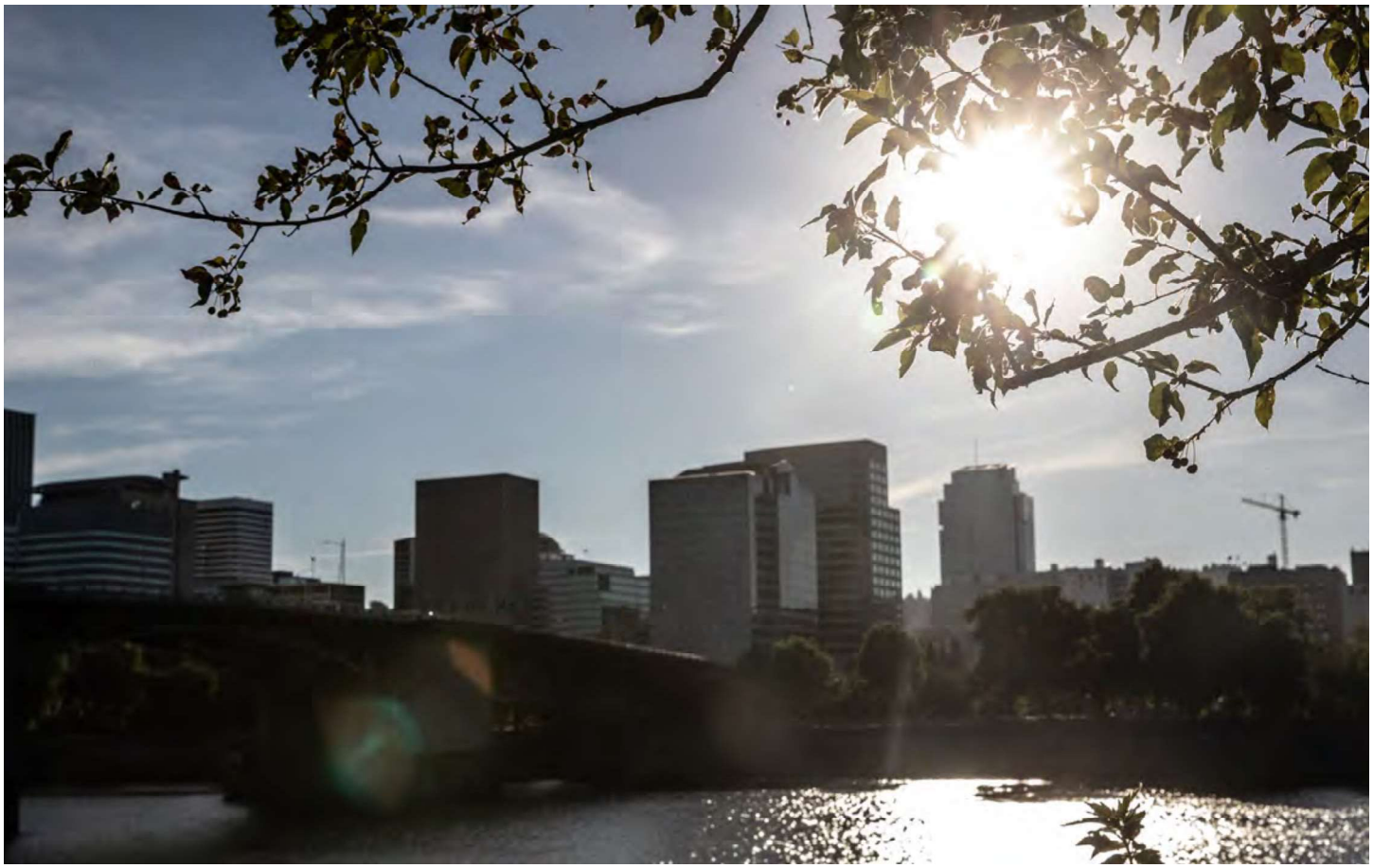
EXHIBIT C

Final Report:

Health Impacts from Excessive Heat Events in Multnomah County, Oregon, 2021

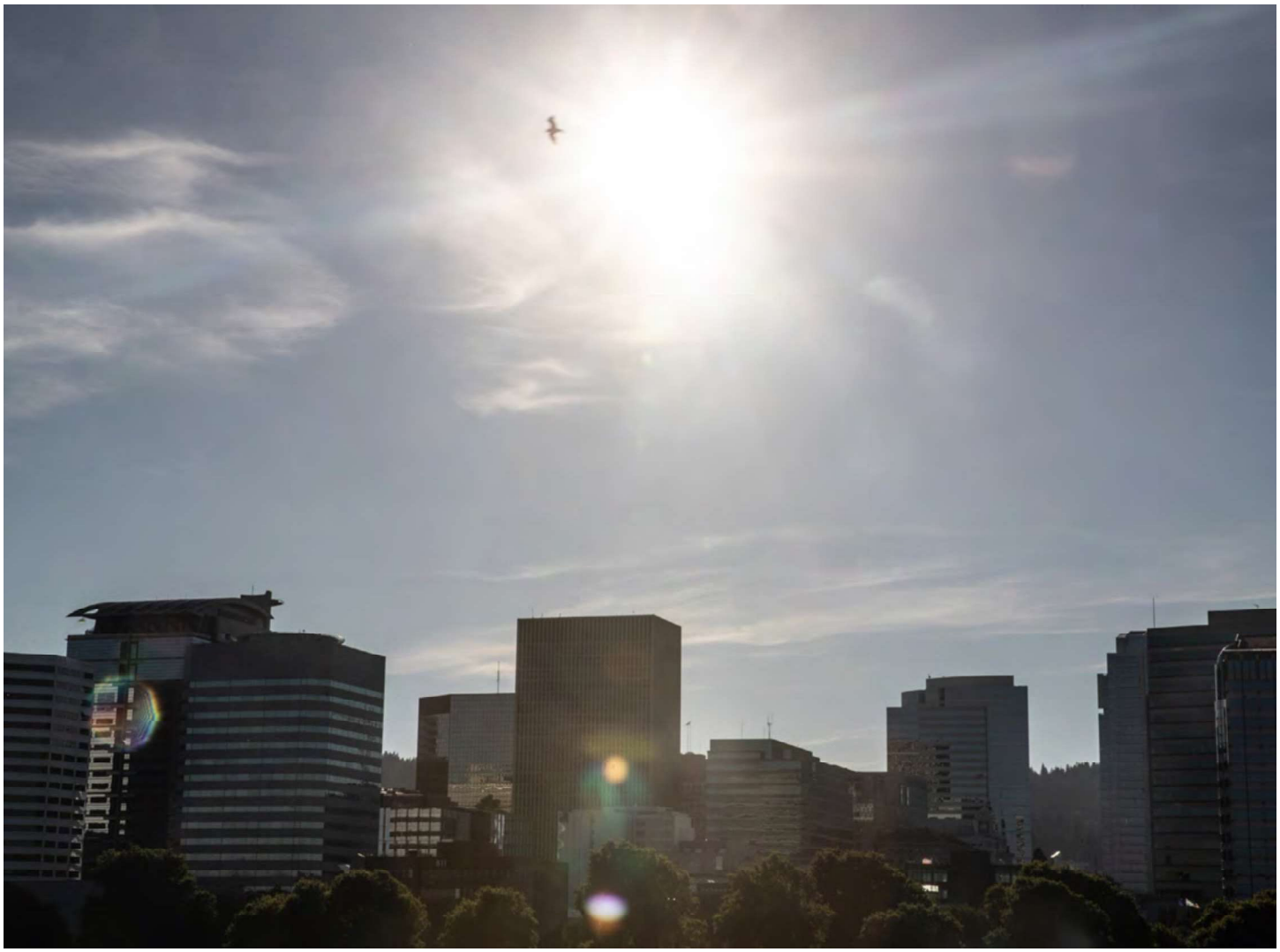
Multnomah County

Published June 2022



Key findings

- There were 72 heat deaths in Multnomah County in 2021— with 69 of those deaths resulting from deadly heat in the last week of June. In a typical year there are zero.
- Deaths from all causes were double the normal level during the week of the heat dome, the week of June 27.
- There were 257 emergency department and urgent care visits for heat illness in Multnomah County in 2021. In a typical year there are 83.
- The following groups were disproportionately affected:
  - Males
  - Older adults
  - Non-Hispanic whites
  - People living alone
  - People living in multifamily buildings
  - People experiencing homelessness or unstable housing
  - People living in warmer areas of the County



Background

Since 2016 the Multnomah County Health Department has tracked emergency room visits and fatalities related to extreme heat. This report provides a final accounting of deaths and emergency department visits resulting from heat during the summer of 2021.

The June 2021 heat dome event made the summer of 2021 especially hazardous for health, with record-setting maximum temperatures of 116 degrees. Immediately after the June heatwave, Multnomah County Health Department produced a Preliminary Review on Excessive Heat Deaths, published July 13. Subsequently, there were two more heat waves in July and August. This report supplements the July 13 report with new information on:

- Heat-related deaths that were not confirmed at the time of the original report or occurred later in the summer.
- Deaths from any cause (all-cause mortality).
- Emergency department and urgent care clinic visits.

Methods

Data sources

Multnomah County Medical Examiner data

The Oregon State Medical Examiner's Office maintains a database of all deaths investigated under its jurisdiction. County death investigators gather information about residence and housing status, and important details from scene investigations and interviews with relatives and social contacts. That information allows the State Medical Examiner's Office to certify cause and manner of death. According to ORS 146.090, the Medical Examiner investigates and certifies the cause and manner of all human deaths that are:

a. Apparently homicidal, suicidal or occurring under suspicious or unknown circumstances;

b. Resulting from the unlawful use of controlled substances or the use or abuse of chemicals or toxic agents;

c. Occurring while incarcerated in any jail, correction facility or in police custody;

d. Apparently accidental or following an injury;

e. By disease, injury or toxic agent during or arising from employment;

f. While not under the care of a physician during the period immediately previous to death;

g. Related to disease which might constitute a threat to the public health; or

h. In which a human body apparently has been disposed of in an offensive manner.

For this final heat report, we counted deaths where the final cause was determined to be excessive heat, or hyperthermia, at any time in 2021. We limited the cases to incidents occurring within Multnomah County. Case information for all investigated deaths under Medical Examiner jurisdiction was extracted from the corresponding database. In 2021, the Multnomah County Medical Examiner's Office identified 72 deaths occurring in Multnomah County in which the final cause of death was hyperthermia. Three deaths occurred in August, outside the dates of the "heat dome," but are summarized here with the remaining 69 deaths. Note that the date of death may be estimated based on when a person was found and/or information about a person's last known contact with family and friends.

All-cause mortality data

Extreme heat is associated with an increase in death from any cause (all-cause mortality).[1] We can compare the number of deaths by month over time and also look at weekly averages of deaths over time to see how the heat event contributed to an increase in deaths even later into the year. These data come from Multnomah County's access to Oregon Health Authority Vital Records. Data from 2021 are considered unfinalized. Data are limited to Multnomah County residents.

Oregon ESSENCE (Electronic Surveillance System for the Early Notification of Community-based Epidemics)

Oregon ESSENCE provides data on heat-related illnesses in local emergency or urgent care clinics, allowing us to examine nonfatal visits related to heat. The heat-related query is based on both chief complaint and discharge diagnosis fields; the full query can be found at the end of this document. Data are limited to residents of Multnomah County. To gather information on the role of intoxicants, houselessness, and occupational exposure, two reviewers independently read the triage notes for each visit (when available) and marked if any of those three categorizations applied. Triage notes are free-text data that capture the presenting symptoms and complaints of a patient. Discordant results were reviewed and resolved by consensus. There are important limitations to using and interpreting ESSENCE data. Visit records represent visits, not individual patients; it is possible that one person could make multiple visits. We were not able to determine how many patients were admitted following their visit. Some visit records are incomplete; 15 percent of the 257 records did not have triage notes. To protect privacy, visit counts fewer than five are suppressed or aggregated.

1 Khatana et al. 2022

Results

Data source 1: Medical Examiner data

Date of death

The National Weather Service issued an excessive heat warning for the Portland Metro region beginning Friday, June 25, through Monday, June 28. The first reports of possible hyperthermia deaths were reported to the Multnomah County Medical Examiner on Sunday, June 27. The Portland Airport recorded confirmed temperatures of 95, 108, 112 and 116 degrees on June 25 through June 28, respectively.

In mid-August, there was another period of high temperatures; the Portland Airport recorded confirmed temperatures of 102 and 103 degrees on Aug. 12 and 13, respectively.

These daily temperatures are visualized in the following graphic, where the bright red boxes indicate temperatures over 100 degrees.

Chart 1. Daily temperature in 2021

Source: Oregon Live

Confirmed deaths investigated by the Multnomah County Medical Examiner most frequently occurred on June 29 (N=25), followed by June 28 (N=12).

Chart 2. Heat deaths by date of death

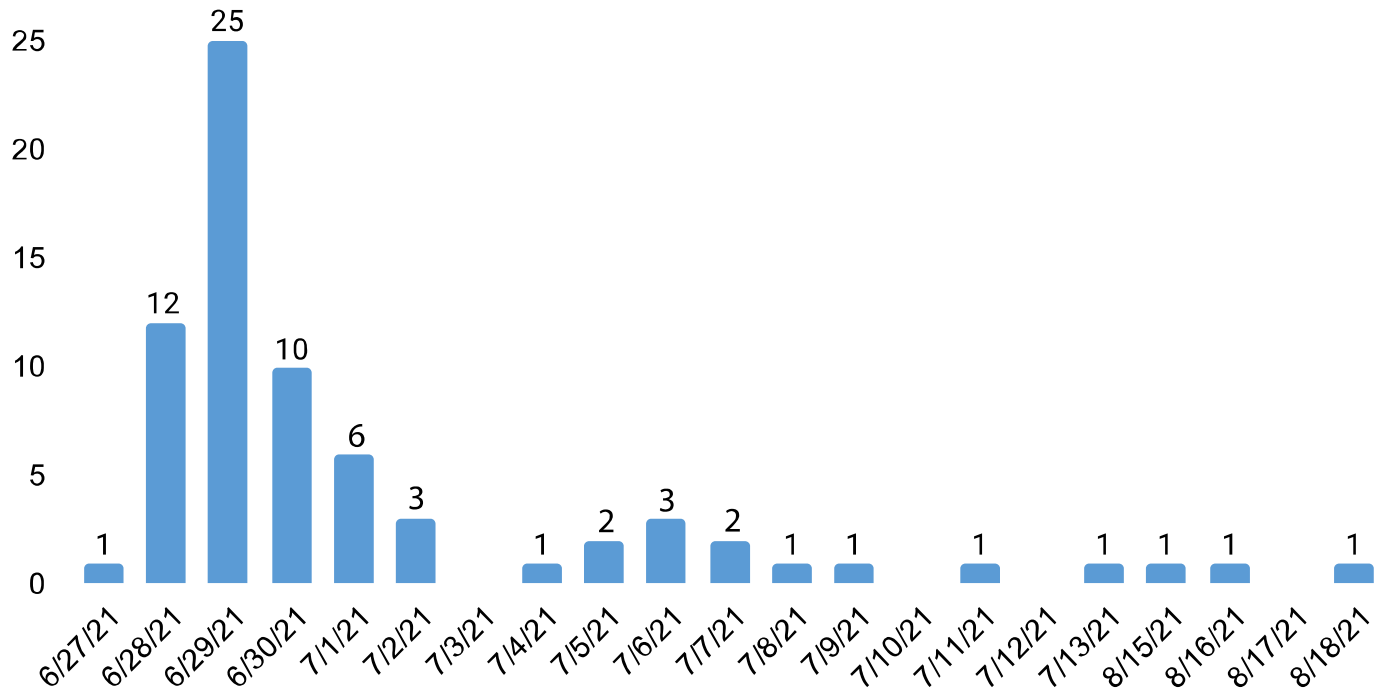


Chart 2 is a time series displaying the count of heat deaths by day during the summer of 2021. The highest count occurred on June 29, the day after temperature in Portland reached the all-time record of 116 degrees. All deaths in June and July are attributed to the heat dome event.

Sex, age, race/ethnicity

Detailed demographics of those who died as a result of heat are displayed in Table 1.

- Two-thirds of deaths occurred in males.
- Most of those who died were older adults; 78 percent of deaths occurred in people 60 years and older.
- The youngest was 36 years old, and the oldest was 97; the average age was 68.
- The majority of deaths were among non-Hispanic whites (59 deaths, 82%) followed by Black/African American (4 deaths, 6%).

Table 1. Demographics of decedents

Sex	Count	Percent (%)
Male	48	67%
Female	24	33%
Age	**Count**	**Percent (%)**
35 to 49	6	8%
50 to 59	10	14%
60 to 69	22	31%
70 to 79	23	32%
80+	11	15%

Table 1. Demographics of decedents (continued)

Race	Count	Percent (%)
White non-Hispanic	59	82%
Black non-Hispanic	4	6%
Hispanic	3	4%
Asian non-Hispanic	1	1%
American Indian/Alaska Native non-Hispanic	2	3%
2 or more races non-Hispanic	3	4%
TOTAL	**72**	**100%**

*From match to vital records death certificate

> Living alone is a known risk factor for heat death.

Housing Type

The vast majority of deaths (68/72, 94%) occurred in the decedent's own residence, more than half of which were multifamily dwellings (42/72, 58%). In Multnomah County, nearly 39 percent of housing units are in multifamily buildings.[2] Of the people who succumbed to the heat in multifamily dwellings, 14 of 42 (33%) lived on an upper floor (floor 3 or higher) of that building.

Four people died experiencing unstable housing.

- One person was found outside a business in Southeast Portland
- Two people were found inside RVs that did not appear to have fixed addresses (one in Northeast Portland, one in North Portland)
- The fourth person was found inside a truck in North Portland where they appeared to be living.

Living alone is a known risk factor for heat death.[3, 4] Of the 68 of 72 deaths in 2021 involving people who were stably housed, at least 48 decedents lived alone. Census data suggest that about a third of all households in Multnomah County are single-person households.[5]

2 American Community Survey 5-year estimates (2016-2020), Table S2504

3 Yale Climate Connections, 2020

4 Klinenberg, 2015

5 American Community Survey 5-year estimates (2016-2020), Table S2501

At least seven people died in apartment buildings charged with caring for vulnerable people. Six people died in apartment buildings owned and managed by Home Forward; one person died in a building owned and operated by Central City Concern.

Two people died in the same independent senior living community, while a third person who died at a local hospital resided in a separate independent senior living community.

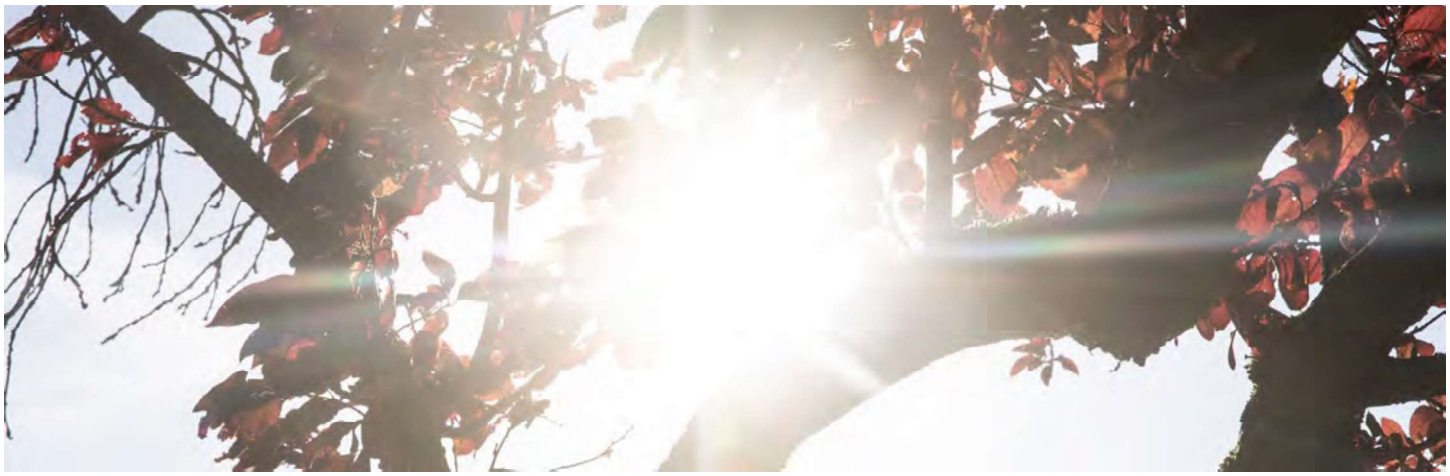
Table 2. Housing characteristics of decedents

Residence type	Count	Percent (%)
Multifamily*	42	58%
Single-family*	18	25%
Mobile home or trailer	8	11%
Unstable housing	4	6%
Live alone**	**Count**	**Percent (%)**
Yes	48	71%
No	9	13%
Unknown	11	16%
TOTAL	**72**	**100%**

Note: Housing type is where the individual permanently or temporarily resided at time of death, regardless of location of death.

*Multifamily includes apartment buildings, SRO, hotels, duplexes, and single-family homes with attached apartment/ADU. Single family includes ONLY single-family dwellings.

**Excludes the 4 persons experiencing unstable housing



Cooling

Lack of air conditioning (AC) was a key driver in mortality. Whereas about 80 percent of people in the Portland area have some level of air conditioning in their homes — and about 50 percent have central air — only 10 individuals (14%) had any mention of air conditioning in the investigator's narrative. Of these 10 individuals, at least seven had units that were unplugged or not working properly.

- In one case, an individual did not use the unit out of fear it would catch fire.
- In another case, a portable air conditioning unit was found in use, but unable to keep up with the heat to sufficiently cool the home.

Half of those who died had only a fan. Using a fan at the outdoor temperatures reached during these types of extreme heat events can make the body warmer and drier. At temperatures in the upper 90s, fans simply move hot air around. The breeze they produce must be cooler than body temperature to cool the body down.

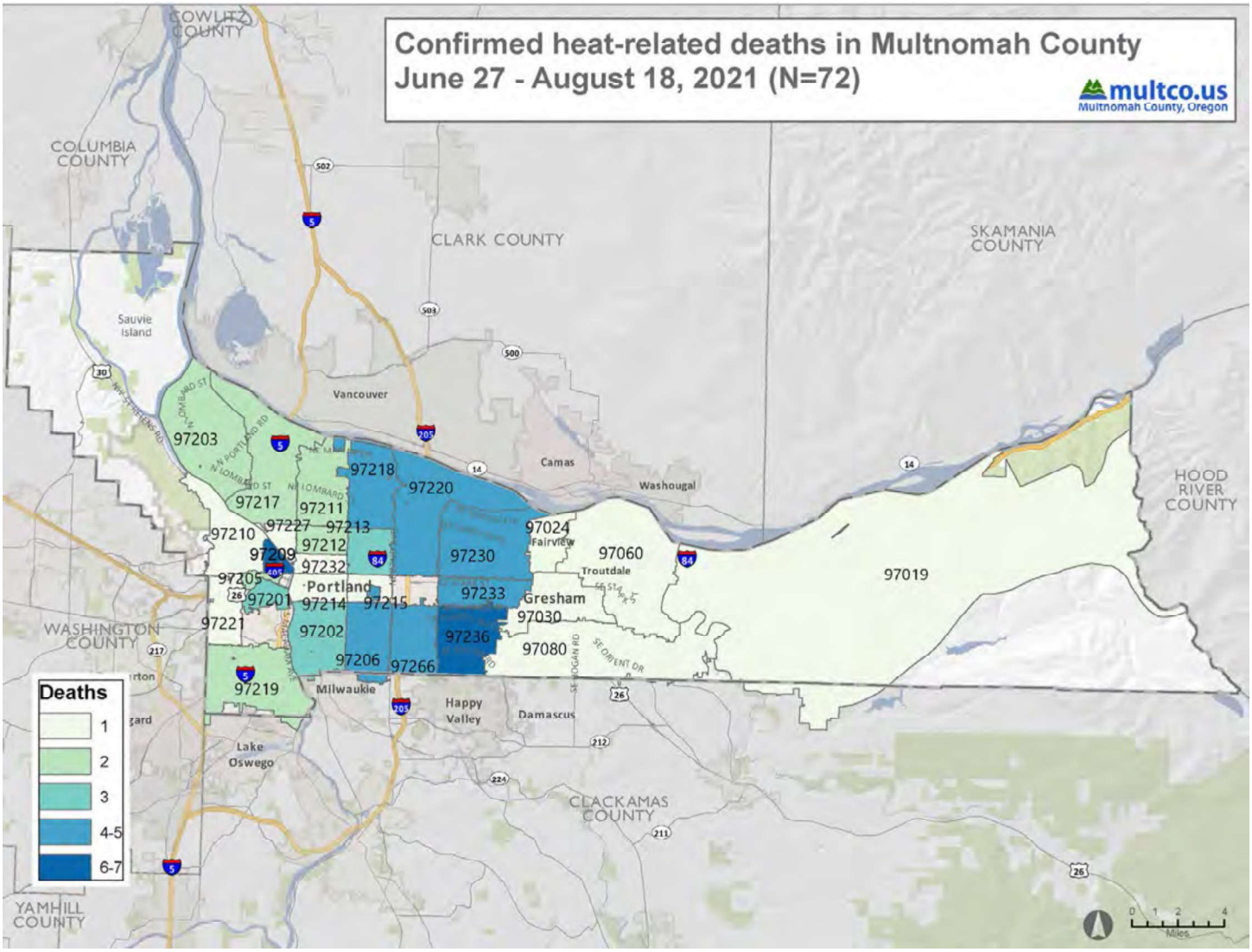
Table 3. Cooling availability among decedents

Cooling type	Count	Percent (%)
Fan only	36	50%
None	13	18%
AC w/ or w/o fan	10	14%
Unknown	13	18%
TOTAL	**72**	**100%**

Geography

Deaths occurred in nearly every corner of Multnomah County, with at least one person succumbing in 28 of the County's ZIP codes. No ZIP code had more than seven deaths (97209, 97236). Map 1 shows the primary location of residence for confirmed cases throughout the duration of the heat event.

Map 1. Heat deaths by ZIP code



Urban heat island effects

Urban heat islands refer to differences in temperature between local areas, generally between urban and rural areas.[6] These differences can appear when vegetation is replaced by hardscape, such as roads and buildings. When this happens, both surface temperature and overall ambient temperatures increase, due to factors such as:

- Excess heat absorption and decreased heat reflection
- Trapping of heat between tall buildings
- Waste heat from vehicles, factories and air conditioners

Map 2 shows mean urban heat island index values by Census tract and corresponding heat-related deaths. Tracts are shaded from "cool to warm," where blue indicates a lower heat index value and orange-red indicates a higher index value. Dividing the mean heat index values into five categories (Table 4) (as displayed in Map 2*) shows:

- 42 deaths (58%) occurred in tracts that had the two highest values (the orange and red on the map)
- 10 deaths (14%) occurred in tracts with the two lowest values (the blue shades on the map) (Table 4).

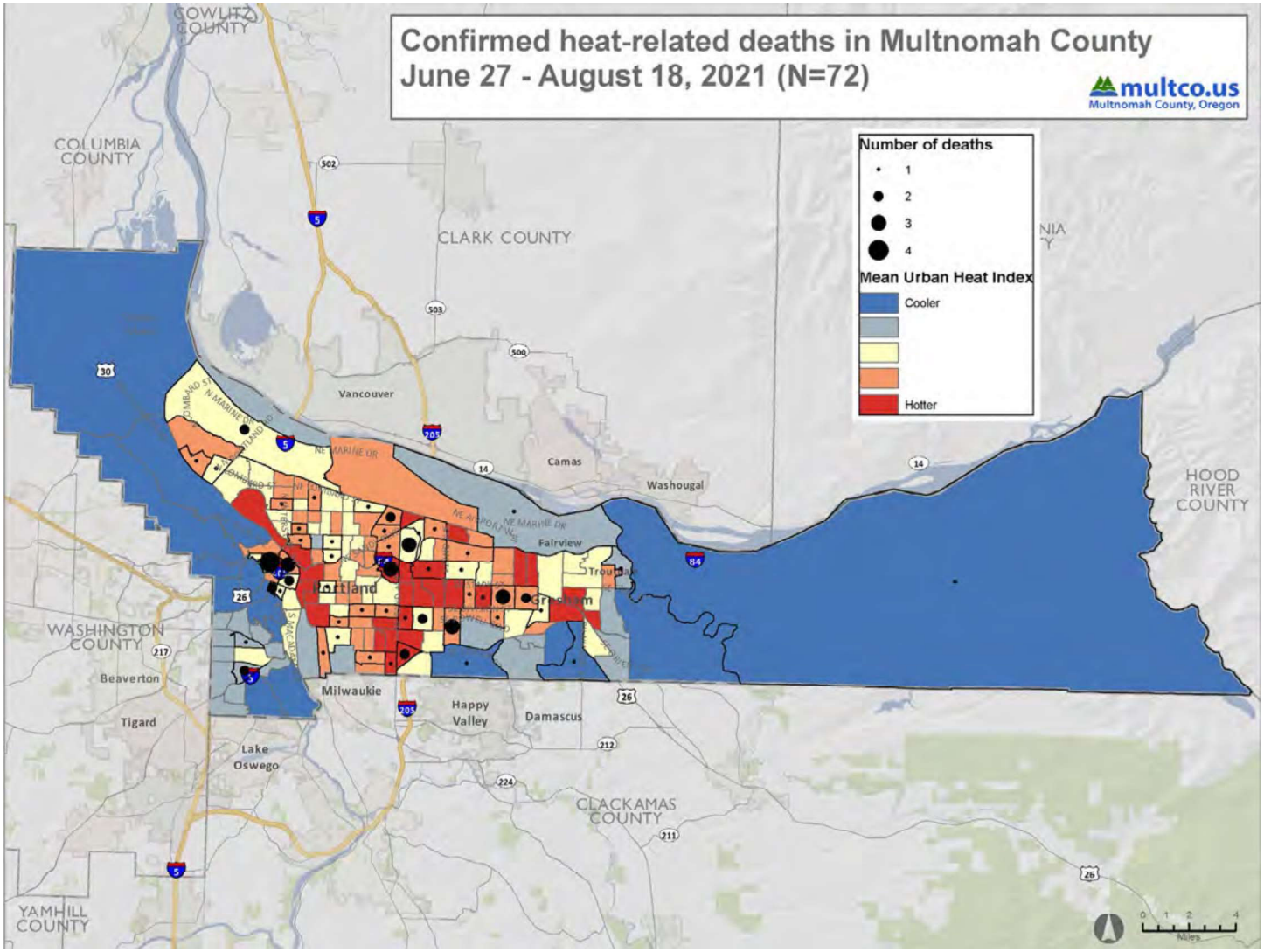
Table 4. Total deaths by range of mean urban heat island index value

Index value	Count	Percent (%)
-10.04 to -4.74 (cooler)	3	4%
-4.73 to -0.48	7	10%
-0.49 to 1.94	20	28%
1.95 to 3.39	33	46%
3.40 to 4.88 (hotter)	9	13%
TOTAL	**72**	**100%**

*Jenks natural breaks method

6 UCAR, 2022

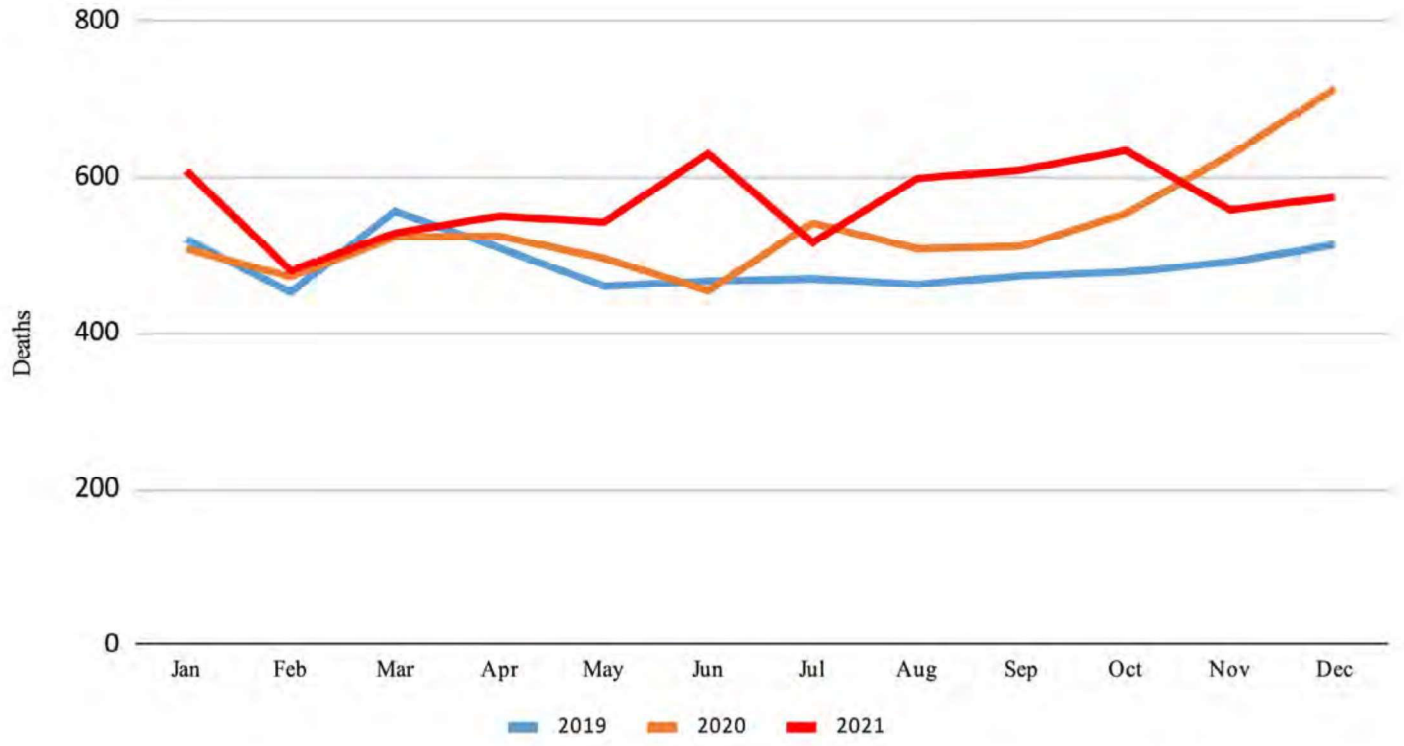
Map 2. Heat-related deaths by Census tract and heat island index



Data source 2: All-cause mortality, Multnomah County

All-cause mortality (deaths from any cause) in 2021 is higher than in both years prior. A large increase in all-cause mortality by month can be seen in the June 2021 mortality number (red line in Chart 3). The total of 630 in 2021 is 37 percent higher than the average value from 2019 and 2020 (460).

Chart 3. Monthly all-cause mortality in Multnomah County 2019-2021

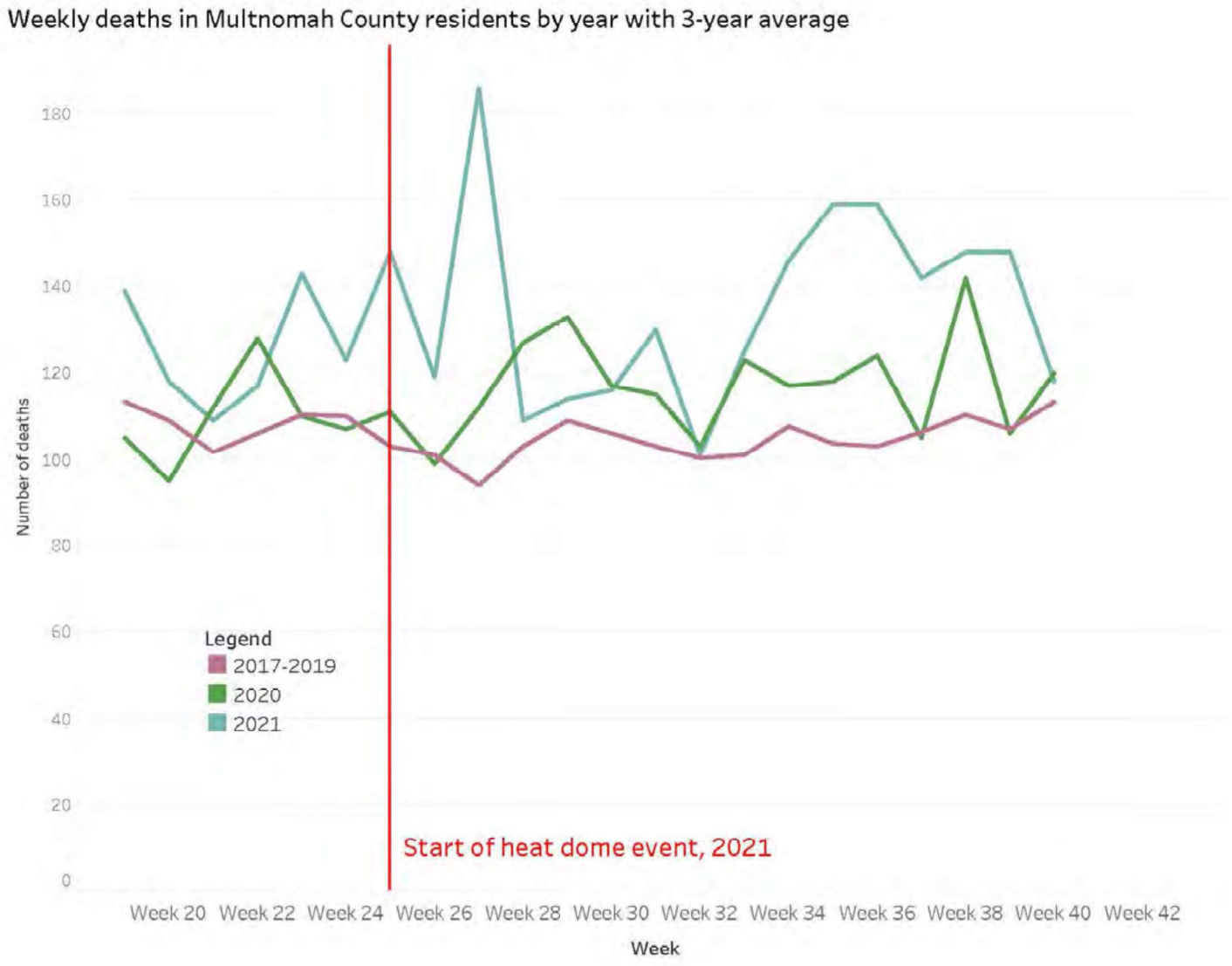


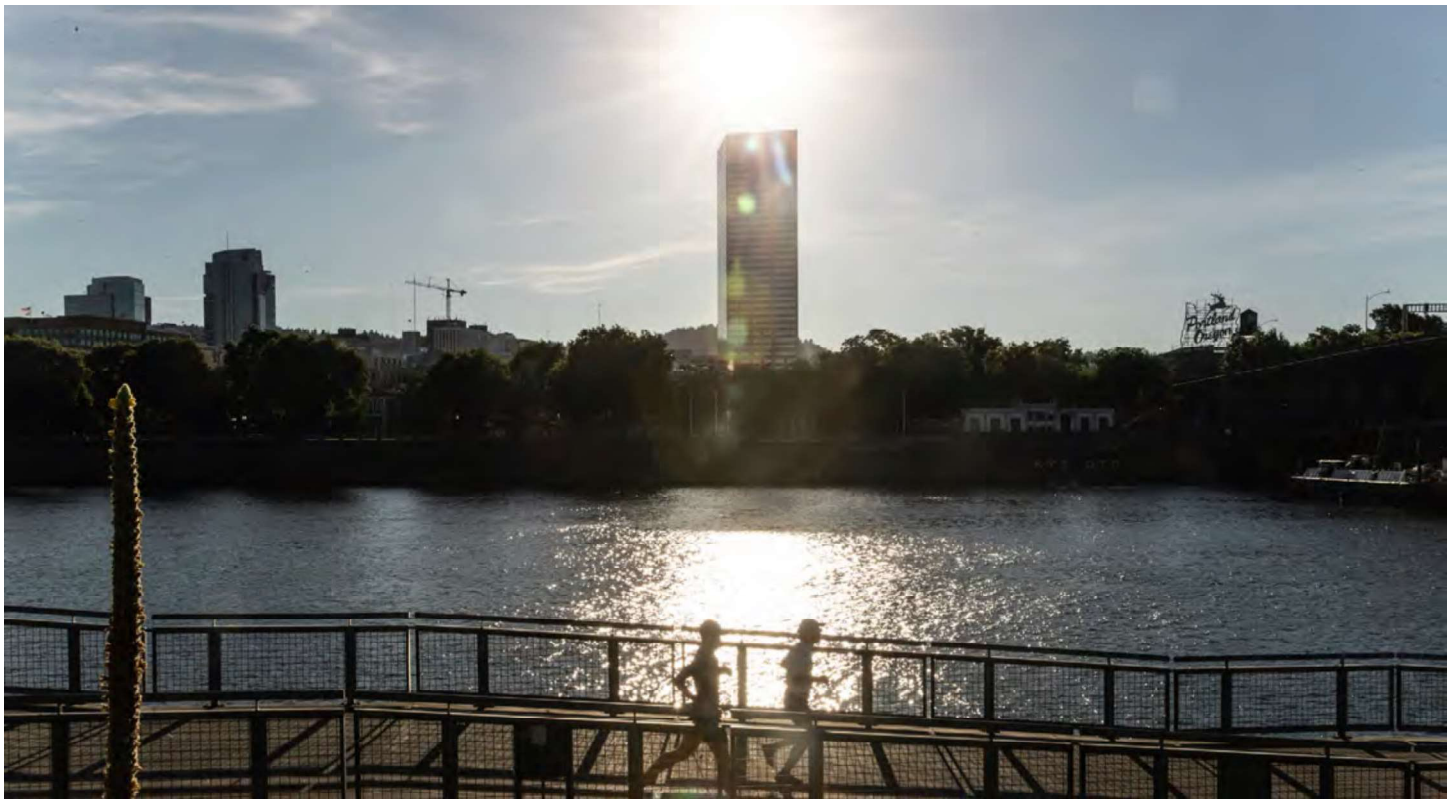
Another way to visualize the mortality data is to look at the 2021 deaths compared to the three-year average of 2017-2019. In Chart 4, the vertical red line indicates the start of the heat dome event. A large spike of 186 deaths is visible in the few weeks after this time period in 2021 (represented by the red arrow). The 2017-2019 average for that week was 94 deaths, or nearly half of the number for 2021. The true increase in deaths is likely due to numerous factors in addition to the heat dome, including the COVID-19 pandemic. However, excess heat is associated with an increase in all-cause mortality, especially for older adults.[7, 8]

7 Khatana et al. 2022

8 CDC 2013

Chart 4. Weekly all-cause mortality in Multnomah County, summer 2021





Data source 3: Oregon ESSENCE

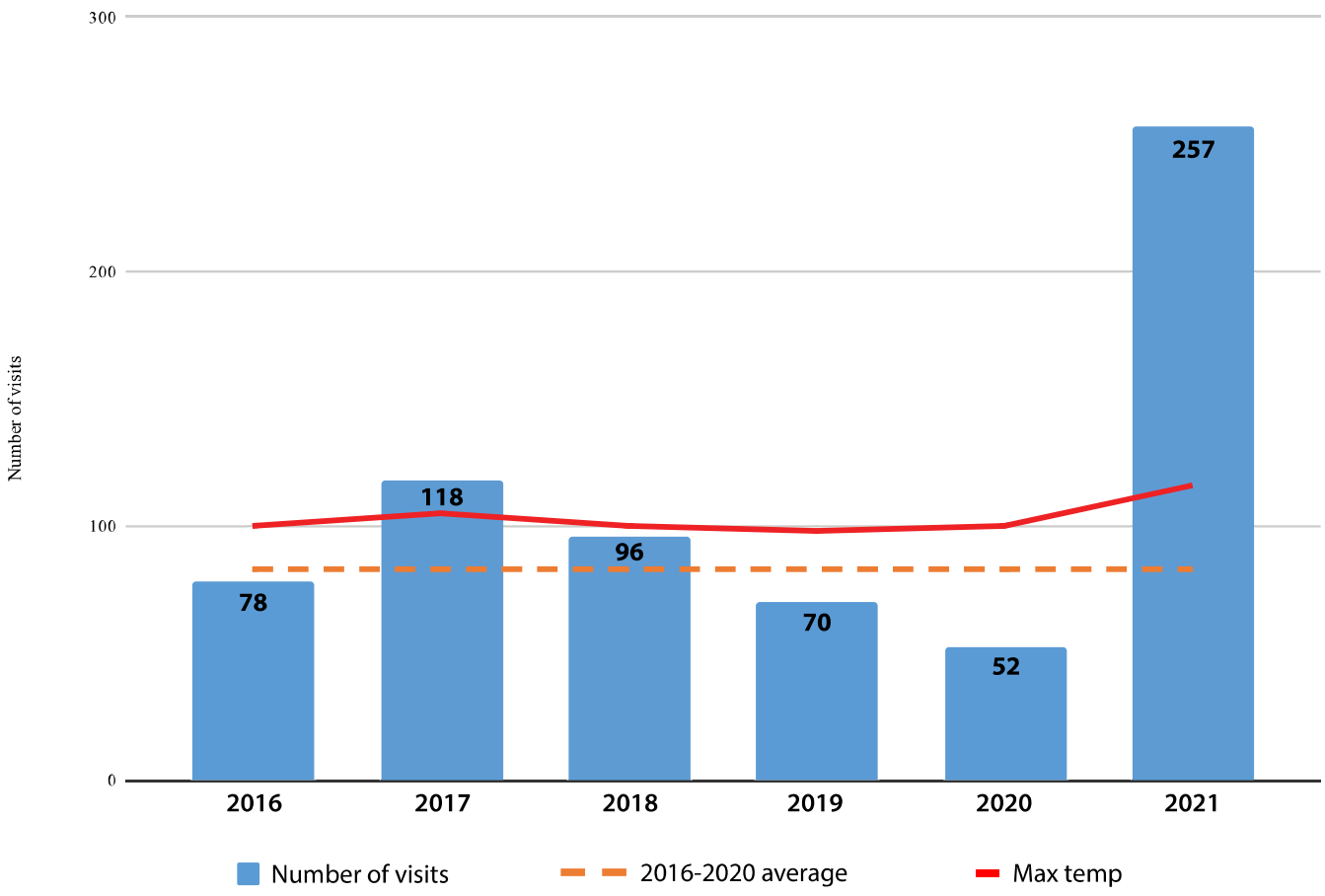
Visits to emergency departments and urgent care centers for heat-related illness are tracked in the Oregon ESSENCE system. Chart 5 illustrates the relationship between heat-related illness visits and maximum temperatures by year.

- The red line in Chart 5 shows the peak temperature recorded at the Portland Airport for 2016 through 2021. Years with the highest number of heat-related illness visits correspond with the highest maximum temperature recorded.
- The black dashed line shows the average number of heat-related illness visits from 2016 through 2020 (May 1 to September 30). At an average of 83 visits, this is just 0.5 visits per day.
- The 2021 value of 257 visits is more than three times higher than the previous five-year average.

Counts were low in 2020 in part because patterns of exposure were significantly changed during the COVID-19 pandemic. Events were canceled that often lead to exposure, such as festivals and large athletic events. People may also have been avoiding treatment for fear of exposure to the COVID-19 virus.

The heat dome event of June 25-30 accounted for 158 visits, or 61 percent of all heat-related visits in summer 2021. During a typical summer, only about three visits would be expected in the same time period. This means that the number of visits during the heat dome was about 53 times greater than would be expected under normal conditions.

Chart 5. Heat-related illness visits to emergency departments and urgent care clinics May 1- September 30, by year with maximum temperature recorded at Portland International Airport.



Patient demographics are different from the population as a whole (Table 5).

- Non-Hispanic white patients accounted for 71 percent of visits but were 66 percent of the County population in 2020.[9]
- Males are overrepresented among patients, accounting for 60 percent of all visits.
- Adults 60 years or older are also disproportionately represented. This age group made up 19 percent of the County population in 2020 but accounted for 42 percent of all visits, and 49 percent of visits during the heat dome event.[10]

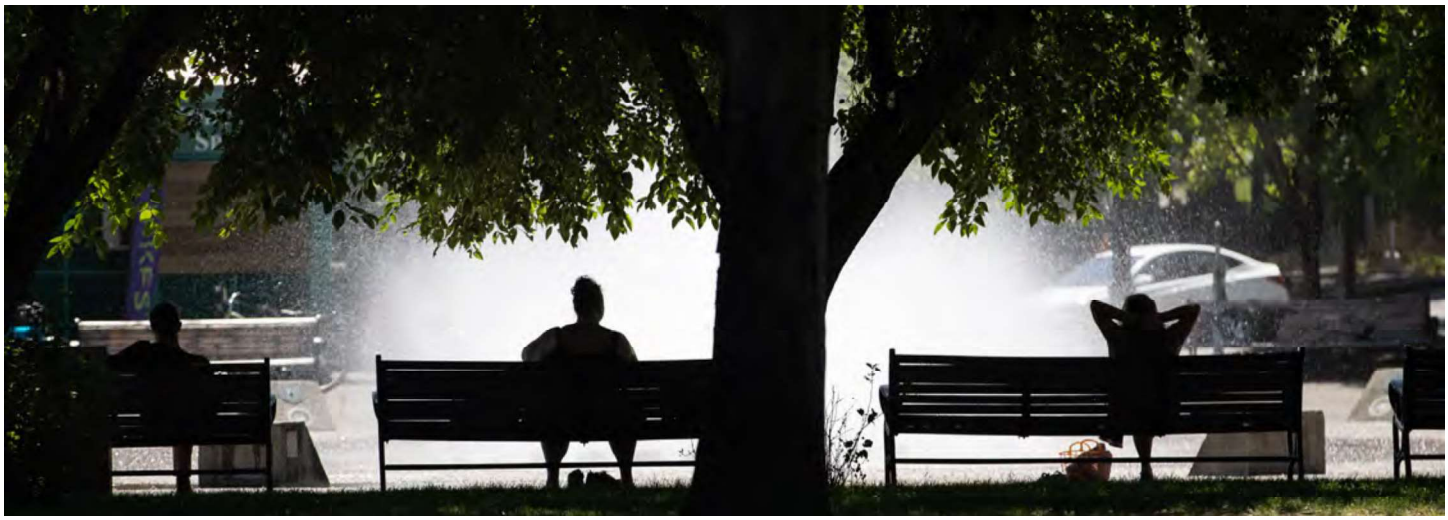
9 United States Census Bureau, 2020 Decennial Census, Table P2

10 American Community Survey 5-year estimates (2016-2020), Table S0101

Table 5. Demographics of emergency department and urgent care clinic patients

Sex	Count	Percent (%)
Male	153	60%
Female	104	40%
Age group (years)	**Count**	**Percent (%)**
0-17	15	6%
18-29	28	11%
30-39	36	14%
40-49	41	16%
50-59	29	11%
60-69	45	18%
70-79	35	14%
80+	28	11%
Race/ethnicity*	**Count**	**Percent (%)**
White non-Hispanic	183	71%
Black non-Hispanic	27	11%
Hispanic	16	6%
Asian non-Hispanic	7	3%
Other or missing	24	9%
TOTAL	**257**	**100%**

*Race and ethnicity categories with fewer than five visits are aggregated in the other or missing category

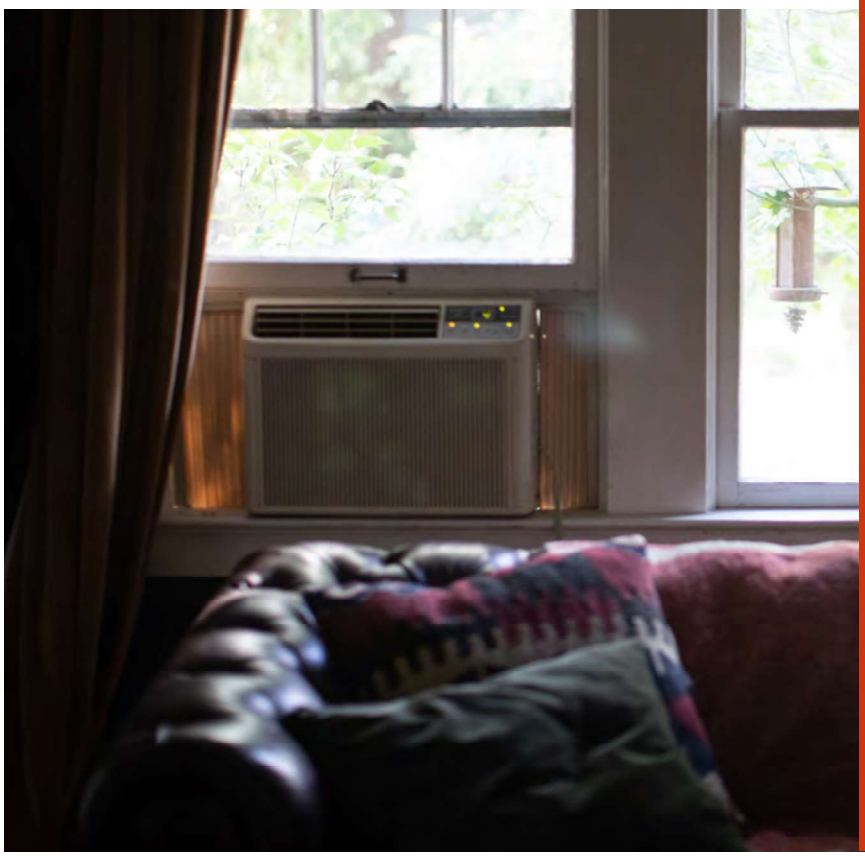


Health Department staff coded triage notes to identify visits with evidence of the following risk factors for heat illness: housing instability, residential cooling type, occupational exposure, in-vehicle exposure, and intoxication. Despite initial attempts, we were not able to reliably identify housing type or whether the patient lives alone. Triage notes were missing for 39 visit records, or 15 percent.

- The most common of these variables was occupational exposure, with 32 visit records, including evidence of exposure on the job or in a work vehicle.
- About one in 10 visit records included evidence of housing instability, a proportion that far exceeds the proportion of County residents experiencing homelessness, suggesting that this group is over-represented among patients.
- Visit records including evidence of intoxication accounted for 9% of the total.
- In-vehicle exposure, including among people living in vehicles, was indicated in 6% of visit records.

Table 6. Evidence of selected risk factors

Risk factor	Heat dome	Remainder of season	Total	Percent of all heat-related visits (%)
Intoxicants	14	10	24	9%
Housing instability	14	11	25	10%
Occupational exposure	13	19	32	12%
In-vehicle exposure	10	6	16	6%



> Access to air conditioning is a life-saving intervention during extreme heat.

Access to air conditioning is a life-saving intervention during extreme heat. Staff examined visit records to determine whether conclusions could be drawn about access to AC. However, it was very uncommon for triage notes to include information on cooling type available; 86% of records included no mention at all. Almost every mention of air conditioning was to stipulate that it was broken or not working. In 11% of records, notes confirmed that no AC was available. We include these frequencies below but caution that this is incomplete information, and reliable conclusions about the role of cooling cannot be drawn from these data.

Table 7. Evidence of cooling equipment

Cooling type	Count	Percent of all heat-related visits (%)
AC	7	3%
Fan only	1	0%
None	27	11%
Missing	222	86%

Ten ZIP codes had 10 or more visits, accounting for more than half (52%) of all visits (Table 8). In Map 3, the ZIP codes with high visit counts are distributed throughout the County, with a concentration in east Portland and Gresham. This is mostly unsurprising, as these are also the most populous ZIP codes. As a rate per 100,000 population, visits in these ZIP codes are similar to the County as a whole. Two exceptions are 97209 (Old Town, Pearl District, Slabtown) and 97205 (Downtown, Goose Hollow, Washington Park), which have a rate far above the County-wide rate of 32 visits per 100,000 population. According to PSU estimates of urban heat island effects, these two ZIP codes are cooler than most of the city during the afternoon and evening, but tend to be warmer in the morning. In part this is attributed to shading and wind channeling in parts of town with taller buildings.[11]

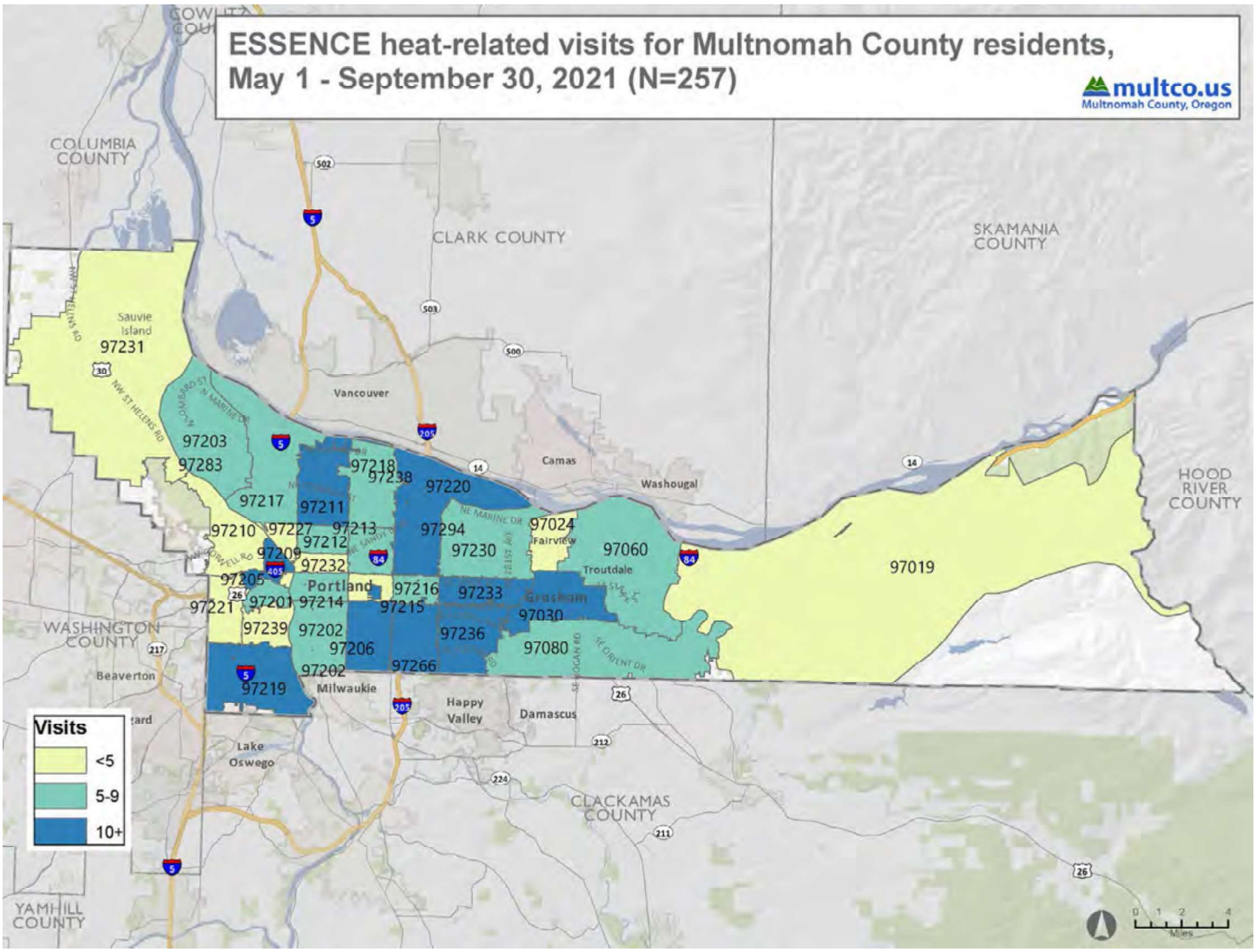
Table 8. Emergency room and urgent care visits for heat illness by ZIP code

ZIP code	Count	Percent (%)	2020 population*	Crude Rate per 100,000
97209	20	8%	19,824	101
97206	19	7%	54,248	35
97219	15	6%	43,274	35
97030	13	5%	38,980	33
97233	13	5%	38,779	34
97211	13	5%	35,738	36
97236	11	4%	39,669	28
97266	11	4%	36,818	30
97205	11	4%	7,679	143
97220	10	4%	29,318	34
TOTAL FOR ALL ZIP CODES	**257**	**100%**	**815,428**	**32**

*American Community Survey, 2020 5-year estimates detailed tables, Table B01003

11 Voelkel, J., Shandas, V., & Haggerty, B. Developing high-resolution descriptions of urban heat islands: A public health imperative. Prev Chronic Dis 2016; 13:160099. DOI: http://dx.doi.org/10.5888/pcd13.160099.

Map 3. Emergency department and urgent care clinic visits for heat illness by ZIP code



Conclusions

Climate change makes it more likely that we will experience more summers like 2021, one that was unlike any experienced in memory. As detailed in this report, extreme heat caused a massive increase in illness and death. While in most years, there are no heat deaths in Multnomah County, or just one, there were 72 in 2021. Similarly, in most years there are fewer than 100 emergency department visits for heat illness, but in 2021 visits surged to 257. The June heat dome was a major driver of these outcomes, accounting for 60 percent of all emergency department visits and nearly all of the deaths. Groups who were disproportionately affected include males, older adults, non-Hispanic white people, people living alone, people living outside or in unstable housing, people living in multifamily housing, and people living in warmer parts of the County.

Vulnerability to climate hazards, including heat, is often described through three components:

- Sensitivity, such as underlying health conditions or biological traits like age
- Exposure, which may be increased by the urban heat island effect, working outdoors, housing type, or having unstable housing
- Adaptive capacity, or the resources available to cope and withstand hazardous conditions

Each of these dimensions of vulnerability likely played a role in the health outcomes observed during summer 2021.

Regarding exposure:

- Deaths appear to have occurred more in places that are part of urban heat islands, while evidence is mixed on emergency department visits.
- Emergency department visit records show that at least some of the visits were related to exposure on the job or in vehicles.
- Lack of stable housing played a role in both illness and deaths.

Regarding sensitivity, the age of decedents and emergency department patients strongly reflects the greater sensitivity of older adults.

Finally, while we have limited evidence on adaptive capacity, it is clear that air conditioning was not readily available for many of the decedents and ill patients.

Acknowledgements

Multnomah County Medical Examiner's Office

Multnomah County Health Officer

Multnomah County Public Health

Multnomah County Communications Office

Media inquiries

Multnomah County Communications Office

Julie Sullivan-Springhetti, Director of Communications
julie.sullivan-springhetti@multco.us
503-502-2741

Kate Yeiser, Communications Coordinator
kate.yeiser@multco.us
503-410-4524

EXHIBIT D

BEFORE THE BOARD OF COUNTY COMMISSIONERS
FOR MULTNOMAH COUNTY, OREGON

RESOLUTION NO. 2023-065

Resolution Declaring Climate Change a Public Nuisance and Authorizing the Office of County Attorney to Pursue Legal Remedies for Damages Caused by Climate Change.

The Multnomah County Board of Commissioners Finds:

A. The scientific consensus is clear that the extraction, refining and combustion of fossil fuels are primarily responsible for the warming that is accelerating global climate change.

B. The scientific community has declared that because of rising greenhouse gas emissions, planet Earth is facing an unprecedented and accelerating climate emergency. Scientists have warned that anthropogenic climate change (ACC) has substantially contributed to rising land, air and oceanic temperatures, the melting of the polar ice sheets, and the increased frequency and severity of extreme heat events, wildfires, drought, floods, and storms. In sum, scientists have declared that unabated climate change presents a "code red" danger to humanity.

C. In 2022, an international group of scientists declared that, as a result of ACC, "the scale of untold human suffering, already immense, is rapidly growing with the escalating number of climate-related disasters."

D. Changes in Oregon's climate are already being felt. Oregon's average annual temperature has increased by about 2.2°F per century since 1895 and of the 13 hottest years recorded in Oregon, nine have come since 2000 and seven have come since 2010.

E. A "tipping point" is a critical threshold which if crossed can abruptly and irreversibly lead to harmful changes in the Earth's climate systems. Under the 2015 Paris climate agreement, virtually every nation agreed to try to hold global warming to 1.5 degrees Celsius (2.7 degrees Fahrenheit). The Intergovernmental Panel on Climate Change (IPCC), a body of climate experts convened by the United Nations, recently reported that we are on pace to cross the 1.5C threshold within the next ten years, far sooner than originally forecasted. The IPCC predicts that beyond 1.5 degrees C the planet will experience a climate "regime shift" in which catastrophic heat waves, droughts, floods, crop failures and species extinction ramp up in both frequency and severity.

F. According to the Oregon Climate Change Research Institute, if greenhouse gas emissions continue at current levels, the annual temperature in Oregon is projected to increase by 5°F by the 2050s and 8.2°F by the 2080s, with the greatest seasonal increases in summer.

G. Globally, the Earth's temperature has already risen approximately 2°F (1.1 – 1.2°Celsius) since the pre-industrial era (1880 - 1900) with the rate of warming doubling since 1981. Globally, the 10 warmest years in the 143-year record have all occurred since 2010, with the last nine years (2014–2022) ranking as the nine warmest years on record.

H. The Oregon Climate Change Research Institute has found that climate change poses a significant threat to Oregon's forestry, fisheries, water supplies, and coastal resources. According to OCCRI, likely climate-related impacts include winter flooding, summer droughts, loss of shoreline, forest fires, worsening air quality, diminished fish and wildlife habitat, retreating glaciers, decreased snowpack, and increased disease vectors and invasive species.

I. Multnomah County is already experiencing a wide range of impacts because of ACC. These include worsening air quality, severe smoke intrusion from wildfires, increased risk of wildfires, "heat domes" and extreme heat, and more intense rain and storm events, among other impacts.

J. In September 2020, Multnomah County recorded the worst air quality in its history, and the worst in the world at that time, caused by a series of unprecedented wildfires in the Cascade and Coastal mountain ranges. For five consecutive days beginning on September 10, 2020, Multnomah County saw emergency room visits for asthma-like symptoms exceed normal levels by 45 to 50 visits on each day of high smoke.

K. Increased temperatures are projected to contribute to: (i) decreased winter snowpack and changes in the timing and volume of streamflows fed by snowmelt; (ii) increased summer water demand, especially during more intense and longer summer droughts; (iii) increased risk of flooding due to more intense snow events and sea level rise; (iv) increased risk of fire in forest lands, open space, and in areas where forest and residential lands overlap; (v) increased risk of heat-related morbidity and mortality during more intense summer heat waves like the Heat Dome event of June 2021; (vi) increased summer air pollution and related health impacts; (vii) decreased summer hydropower production and increased summer energy demand, especially from air conditioning; (viii) increased harm to aquatic wildlife because of warmer water temperatures in streams, rivers, lakes; and (ix) increased shifts in habitat, invasive species, and insects affecting forest health, agriculture, and ecosystem function.

L. Anthropogenic climate change is projected to soon impose on the Oregon economy costs approaching $27 billion annually, through only six mechanisms: increases in food costs, loss of income, increases in wildfires and related smoke, increases in heat-related deaths and declines in salmon populations. This is the equivalent of about $15,000 per Oregon household per year (excluding costs from droughts, storms, sea-level rise, increased cooling and air conditioning, irrigation water shortages, psycho-social trauma, increased pests, invasive species and disease outbreaks, increased migration, reduced outdoor recreation, and increases in violence and suicides).

M. Projected ACC impacts in Multnomah County have widespread implications for residents, infrastructure, and ecosystems translating to direct and indirect economic impacts on the County itself.

N. Impacts of ACC on the health of Multnomah County residents include: (i) increased demands on emergency medical services with more heat-related illness and mortality; (ii) increased respiratory and cardiovascular disease due to projected increases in wildfire smoke, ground-level ozone, and allergens; (iii) increased risk of poisoning from cyanotoxins produced by harmful algal blooms; (iv) increased illness associated with changes in freshwater and marine toxins and pathogens; (v) increased risk of illness associated with the anticipated spread of vector-borne diseases carried by mosquitoes, rodents, and ticks; and, (vi) increased

mental health stress and risk of injury or death associated with more extreme climate or weather-related events such as storms, heat-waves and landslides.

O. Extreme heat, exacerbated by ACC, is already exacting a heavy toll on Multnomah County and its residents. In late June of 2021, Multnomah County suffered an unprecedented "heat dome" event in which 72 residents perished, with 69 of those deaths resulting from extreme heat. In a typical year there are zero heat deaths in Multnomah County in late June. Deaths from all causes were double the normal level during the week of the Heat Dome event. During that extreme heat period, daily maximum temperature records were shattered. Temperatures in densely urbanized areas reached 116°F (with spots maxing out at 125°F) – a staggering 40°F above the average daily temperature from previous years.

P. In 2022, Multnomah County experienced the longest stretch of extreme heat on record, with four heat deaths occurring during this period. In total, there were five heat deaths in Multnomah County in the summer of 2022.

Q. The current and future impacts of climate change will exacerbate pre-existing inequities in health, housing, employment, and income and are expected to have disproportionate effects on children, older adults, outdoor workers, communities of color, low-income households, people who are socially or linguistically isolated, pregnant women, and people with chronic medical conditions.

R. In 2007, the State of Oregon declared that "it is the policy of this state for state and local governments… to prepare for the effects of global warming and by doing so, prevent and reduce the social, economic and environmental effects of global warming." ORS 468.205(2). To prepare for, mitigate and adapt to the negative impacts of ACC, public resources and money have been invested, and will continue to need to be invested in ever-increasing amounts, thereby placing further strain on the County's already limited budget.

S. A "public nuisance" generally refers to any conduct or action that unreasonably interferes with the health, life, property, well-being and rights of the members of the Multnomah County community. ACC is an ongoing threat that interferes with the community's use and enjoyment of natural resources and disrupts the general welfare, causing harm to our common environmental, social, health, economic, and political interests.

T. Globally, greenhouse gasses arise from several sources. The major source of GHGs is the combustion of fossil fuels, such as oil, natural gas, and coal. Scientists have reported that the burning of fossil fuels has contributed between 70% and 79% of atmospheric carbon dioxide, which today stands at 423 ppm, up from 317 ppm in 1960. Atmospheric CO2 today is more than 50% higher than pre-industrial levels. Historians have reported that the fossil fuel industry as early as the late 1950s was aware of serious consequences of burning fossil fuel products.

U. Burning fossil fuels generates carbon dioxide, a gas that remains aloft in the atmosphere for decades, trapping radiant heat, and warming the air, land and water. The fossil fuel industry also generates methane (Ch4), primarily from venting and leakages in the production and gas transport pipelines. Methane is a far more potent greenhouse gas with a shorter atmospheric lifespan than CO2. Atmospheric concentrations of methane have increased 160% since pre-

industrial times. Since the early 1970's, both the cumulative giga tons of GHGs emitted, as well as the rate of emissions, have dramatically increased.

V. The Environmental Protection Agency (EPA) released a study which stated that the most severe effects of climate disproportionately fall upon low income and minority communities. Underserved communities are the least prepared for and struggle to recover from climate related events such as flooding heat waves and poor air quality.

W. High temperatures can lead not only to heat exhaustion and heatstroke, but they can also increase the formation of smog and the severity of pollen, both of which in turn contribute to respiratory problems including asthma.

X. The County has responded to the dangers of heat related health concerns by opening cooling centers throughout the County to prevent residents from having to suffer the dangerous consequences of prolonged exposure to the heat.

Y. The County has worked to face increased climate related challenges and developed the Climate Action Plan and established the Office of Sustainability to advance the County's economy, improve public health, and promote social equity through environmental stewardship initiatives.

Z. As a County, it is our responsibility to show residents how we have prepared and how we are preparing for increased climate related concerns and how we plan to address current climate related concerns.

AA. The County has begun the process of assessing the ACC impacts and the budget required to prevent, prepare, mitigate and adapt to foreseeable climate disasters, which include (but are not limited to): economic impacts of extreme heat events, drought and wildfire smoke; repairs and fortifications of infrastructure; threats to public health; impacts to water and agricultural systems, transportation and jobs; and implementing emergency response centers, community shelters, and public cooling centers.

The Multnomah County Board of Commissioners Resolves:

1. Anthropogenic climate change has increased the frequency, duration and intensity of a number of disasters, which include extreme heat events (such as "heat domes"), wildfires (and wildfire generated smoke), drought, floods and storms, among other disasters, each of which pose a threat to the public health of the members of the Multnomah County community. These anthropogenic climate change driven extreme weather events are a continuing public nuisance.

2. The Office of County Attorney is authorized to immediately pursue legal remedies for damages caused by climate change as well as future abatement and adaptation costs caused by ACC including, but not limited to, litigation.

ADOPTED this 22nd day of June, 2023.

BOARD OF COUNTY COMMISSIONERS
FOR MULTNOMAH COUNTY, OREGON

Jessica Vega Pederson

Jessica Vega Pederson, Chair

REVIEWED:
JENNY M. MADKOUR, COUNTY ATTORNEY
FOR MULTNOMAH COUNTY, OREGON

By Courtney Lords
Courtney Lords, Senior Assistant County Attorney